

COMMERCIAL CAR JOURNAL

with which is combined Operation & Maintenance

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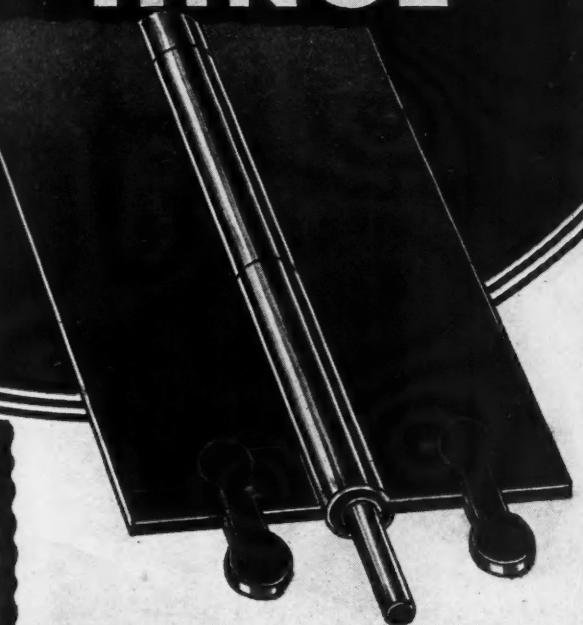
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COMMERCIAL CAR JOURNAL
DECEMBER, 1936

HANSEN Continuous HINGE

A NEW HINGE THAT MEETS NEW-DAY NEEDS IN HINGE DESIGN

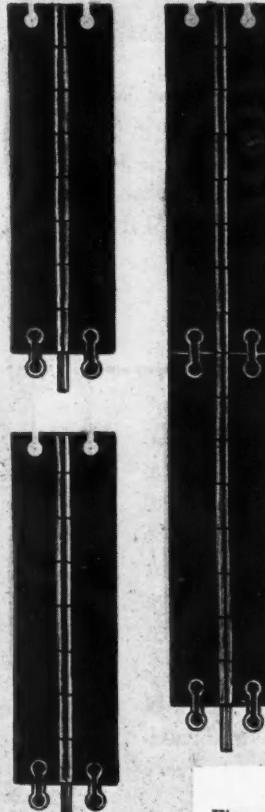


Above—Section of Hansen Continuous Hinge, showing design and construction details.

At left—Two views of Hinge, before and after assembly.

Hinges of All Lengths from One Length

ADVANCED and different in design, the Hansen CONTINUOUS Hinge is the logical successor to the piano type hinge. ONE standard length now supplies hinges of ALL lengths. Each length is of uniform design, 12" long. Simply by connecting multiples of this length, hinges of any length may be made.



Easy to Assemble

Hinge forms a strong, solid unit merely by connecting rod and couplings, as shown. For fractional lengths, cut off the last unit to desired length. No waste. Left-overs or odd lengths may be used on other jobs.

Ask for Folder

A. L. HANSEN

MFG. CO.

5047 Ravenswood Ave.
CHICAGO, ILL.



The PROOF is



TESTS LIKE THIS quickly show why Marfak stays in bearings so much longer than ordinary grease lubricants—why the Maintenance Awards for the past six years have gone to fleets using Marfak for chassis lubrication.

ONCE IN 25,000 MILES.

One of the largest fleet operators in Virginia packs wheel bearings with Marfak, and does not remove hub-caps even for inspection until vehicles have traveled 25,000 miles.

LARGEST OPERATOR IN U. S. of both buses and taxicabs, uses Marfak exclusively for chassis lubrication.

TEXACO *Truck*

COMMERCIAL CAR JOURNAL
DECEMBER, 1936

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The Overload



COMMERCIAL CAR JOURNAL

Vol. LII. No. 4 DECEMBER, 1936

The Book at Par Value

MR. C. J. ANTHONY whom you met long ago and learned that he was a friend concludes his series on Diesel operation. In this article Mr. Anthony clears up any lingering doubts you may have had up to now and he answers those questions you were about to ask. We hope that we have not heard the last of Mr. Anthony.

Crowding hard at Mr. Anthony's heels is some more material in the fleet operator style. While not so lengthy as Mr. Anthony's the individual contributions from fleet operators in the shop kinks section show what happens when a fleet operator tries his hand as a design engineer. Darn clever these fleet operators. The fleet operators whose names you see in this section were clever enough to earn \$5 for each contribution. COMMERCIAL CAR JOURNAL has many more \$5 bills left with which it will gladly part for more fleet ideas.

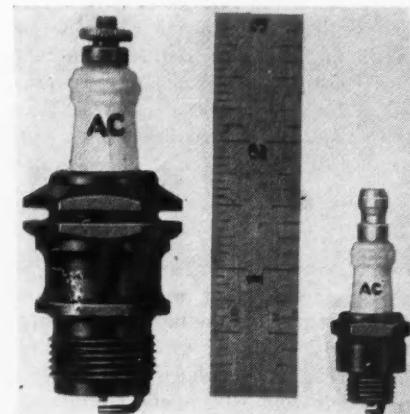
We Paged Mr. Garbutt

MR. M. R. GARBUTT sent in a shop kink that is technically known as a "Lulu." Immediately upon re-

ceipt of the eye-brow raiser the editors attempted to get a photograph. You can just imagine how chagrin spread all over the editorial department when our letter was returned unclaimed with addressee unknown at the address given by Mr. Garbutt. The result is that you get the shop kink without illustration. Never before has this magazine had trouble locating people to whom it owed money but all of this has been cleared up by the alert editors and the accounting department will be spared the embarrassment of having a check and no one to send it to. All of this is by way of explanation of the absence of an illustration and anyhow we thought it was interesting. P. S. The photographer has not yet sent in the photograph of Mr. Garbutt's shop kink and if we do not have trouble with him, too, we shall print the illustration next month just to show you the evidence.

Under the Hood—

AND behind the trick louvres of the 1937 passenger cars there is a power plant and drive system although you might forget it for the moment—what



The pee-wee plug on the right is the new 10 millimeter spark plug developed by AC engineers. It is the smallest ever used as standard equipment on passenger cars. Its comparison to the standard plug on the left gives some idea of its size

with the emphasis on appearance as it is. In this issue you will find an analysis of the salient mechanical features of the new cars, especially those trends that may find themselves in truck design before long and those features that will affect fleet operation. We recommend the story. There is positively not one paragraph devoted to upholstery or gimcracks. In addition there are descriptions and illustrations of the small one-wheel and two-wheel trailers as a result of the interest shown in inquiries.

We Confine Ourselves

WHEN the story on Ten Common Faults of Truck Drivers first appeared in this office it seemed as though we had been offered some spicy reading and it might be unfair to pick on truck drivers with so many fleet operators around. But upon reading the manuscript we found that the author had confined himself to the truck driver's driving. For the lofty purpose of improving driving the story is offered and we hope you do not misunderstand the head. . . . And for some thoughtful reading the After Hours comments on the hours of service for drivers' testimony at the ICC hearing is recommended. We hope we have not kept you overtime.



These men are the safest truck operators in the country receiving their awards from the ATA at the recent Chicago convention. John L. Rogers, Director, Bureau of Motor Carriers, is presenting the large cup to C. L. Riddle, President, Indiana Motor Traffic Association. Winners in various classes are: Back row: John Dixon, Kedney Warehouse Co., Grand Forks, N.D.; Don E. Weber, Beatrice, Neb.; Robert K. Carter, Richmond, Va.; Harry D. Zarbarsky, St. Johnsbury, Vt. Front Row: Harry Dunn, Dunn Beverage Co., Indianapolis, Ind., and Riddle and Rogers

The Overload

The Railbirds Rebel

THIS railroad help must be getting out of hand. The Brotherhood of Railroad Trainmen of Florida has gone on record in favor of a reduction in that state's gasoline tax of 7 cents per gal., one of the highest in the country. Tsk, tsk, and just when the railroads got it where they wanted it, too.

Let There Be Light

THE safety division of the I.C.C. is now in possession of an appropriation which will provide the means for going ahead with tests of clearance lights. The Bureau of Standards will provide the technical knowledge and equipment and actual trucks with actual lights under actual conditions will be used for test. The result should be uniform lighting for all trucks and based upon scientific knowledge.

Virtue in One Syllable Words

GLEANED from some I.C.C. correspondence: "I can't afford to hire a lawyer every time you write me a letter." There is something worth thinking about in that sentence.

FREE

Mark with an X and mail, as usual, to The Editor, Commercial Car Journal, Philadelphia, Pa.

- A—Operating costs on Buda Diesel powered trucks.
- B—When is oil in good condition and what to do about it—An Oil Filtration Manual.
- C—A 16 page illustrated booklet featuring the economy of Four Wheel Drive Trucks.
- D—Cold Weather Operation — A technical booklet by GMTC engineers.
- E—Two new bulletins on dump bodies and hoists for trailers and six wheelers.

Name _____

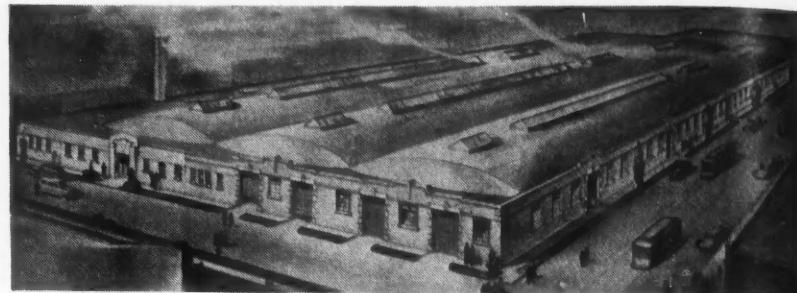
Title _____

Firm Name _____

Address _____

City _____

No. Trucks _____ No. Cars _____



This little garage and freight terminal is going to be just a cozy nook for the Lathan Cartage Co., Chicago. Claimed to be the largest truck terminal in the world, it will be 375 ft. long and 267 ft. wide to provide 105,000 sq. ft. of floor space—on the (one) level



Mason-Dixon Lines, Atlanta, Ga., operates this fleet of aluminum trailers of monocoque design on a 942 mile run between Atlanta and New York City. Trailers are 20 ft. long, 7 1/2 ft. wide and 6 1/2 ft. high. Each unit weighs 3720 lb. President King claims a saving of \$13.50 per unit per run because of the lighter weight trailer. Using Studebaker tractors, shippers are guaranteed second morning delivery between the two points

Diesels for Dumps

JUST when the industry seemed to have the Diesel engine nicely cataloged in the long-haul section only, along comes word that the Turecamo Contracting Co. of Brooklyn, N. Y., has standardized its fleet of dump trucks with Cummins Diesel engines. Just to make matters more complicated, the Highway Department, State of Idaho, has converted to Diesel power two trucks that are used for snow removal and highway maintenance.

Shock Lubrication

THE colloidal graphiters are promoting a new term in the lubrication vocabulary. It is, as you may have gathered from the head, "Shock Lubrication." It describes the condition encountered when starting a cold engine before the lubricant starts flowing or that period during heavy going when the film strength of liquid lubricant decreases until it no longer provides adequate lubrication. At these times graphite-treated surfaces come in handy, according to our advices, so we respectfully suggest that colloidal graphite be called "shock lubricant."

Highway Showroom

ON U. S. Highway No. 45 in the State of Wisconsin the Four Wheel Drive Auto Co. has a showroom where tourists are invited to drive through. From July 4

to Oct. 19, 8417 visitors drove through the building in 2324 automobiles. There is a museum in connection with the 100-ft. by 380-ft. showroom and many of the visitors stop to examine the exhibits. There is no record to show how many orders were taken by salesmen who were hanging on to running boards.

Christmas Greeting

HAPPY LOADINGS.



The Tocco Division of the Ohio Crankshaft Co., Cleveland, developed this process whereby crankshafts are hardened by electrical heat in 2 minutes where it took five hours by the old furnace heating method. Inductor blocks clamped about the parts to be hardened induce a current into the surface to be hardened—and presto! it's done

Cars to the GROUND

Show Sally

Knowing how seriously this department takes itself you can well imagine that we had our pipe lines into the Newark Truck Show and the New York Auto Show laid before either of these exhibitions opened. We were rewarded in Newark by dope from the feedbox on a new national spring service. There will be about 100 service stations over the country. The proprietors will take a real course on spring service from headquarters and then they will receive manuals and supplements as they are necessary. In the local spring shop there will be real scientific instruments for measuring spring rates, etc., which will be leased to the local man by headquarters. They claim real reduction in maintenance costs and weight distribution when the springs are right according to the instruments.

Chevrolet Showing

The powerplant of the 1937 Chevrolet trucks shown at the Newark Truck Show and the New York Auto Show is slightly larger than that of last year. The bore is increased to $3\frac{1}{2}$ in. and the stroke reduced



Chevrolet at the Newark Truck Show

to $3\frac{3}{4}$ in. giving a piston displacement of 216.5 cu. in. The horsepower is 78 at 3200 r.p.m. and the torque is 170 lb. ft. at 850 r.p.m. to 1550 r.p.m. The engine has been redesigned and the crankshaft now has four main bearings and weighs 68 lb. Lubrication is by pressure to the main bearings, camshaft bearings, and rocker arms

and by pressure stream and dippers to the connecting rod bearings. The pump is a gear type. Hypoid gears are used on the sedan deliver and coupe pick up and spiral bevel gears on the commercial car and $1\frac{1}{2}$ ton truck, the latter having a full floating axle.

New York Note

Not to be outdone by Newark on the other side of the Hudson, the New York show took this department to its bosom to the extent of telling us that rear engine cars would be possible only when engineers had found a way to cut powerplant weight in half. Try as they will with present engines the engineers wind up with a car that is unstable because of the increased weight at the back.

Refrigerator Recipe

While all of this eastern activity is going on, our Mid-West operative calls headquarters to tell us that a brand-new refrigerating system for trucks will be ready for announcement soon but that he is under wraps and can't tell more now.

Air Conditioning Apology

While wandering from one fellow who knows the answers to another, we came upon an insider who told us that air-conditioning units for passenger cars would cost about as much as the car, present knowledge being what it is. He was extremely optimistic about future chances of getting the unit down in size and weight to where it could be set in the truck and left at home when the weather turned cool. He would not venture a price at what such a unit would sell for, nor when.

Signal Sentence

Pretty soon fleet operators are going to have a wide choice in design of directional signals. The manufacture of these signals seems to intrigue at least one new manufacturer each month. This month there is a report among our accumulated dispatches to the effect that another well-known manufacturer will add directional signals to his line. Details in 60 days.

Finger Feint

One of our spies did a less than expert job on this particular item. His report is



A good snooze is a good investment. So thinks the Cunningham Oil Transport Co., La Junta, Col., who purchased this air-conditioned Utility Trailer from Allan Kayser, who designed and built the truck. Operating schedule calls for a 1,000-mile trip in 36 hours, hence sleeping accommodations, 7 ft. deep by 28 in. wide. The seat hinges in three parts which flatten out to form the bed. Cab is air conditioned to 74 deg. by a separate power unit. Truck and trailer have a gross weight of 68,000 lb. Overall length is 49 ft. The unit is powered by a Cummins diesel

confusing. It mentions a finger-tip control for trailers and with our usual astuteness we have figured out that it is in connection with brakes but beyond that we are not clear. To make up for this failure we promise more detailed information later on.

Surprising Score

The Hercules Motors Corp. has sent this department its box score and some of the names may be a surprise to you. To be extremely accurate we quote: "Among the major truck and bus manufacturers who are making Hercules diesel power available to their customers are the Chrysler Corp., Diamond T, Federal, General Motors, Reo, Twin Coach, and White."

EP Epigram

This department in one of its expansive moments suggested the use of EP lubricant in the gear box of an oil circuit breaker used in electric power transmission to a designer acquaintance who confessed to not being satisfied with the performance. Now what this department does not know about switch gear is nothing short of amazing, but the designer just called up to report that the circuit breaker closed at 185 volts when the conventional 600W was used and at 175 volts when an EP lubricant was substituted. This reduction of the power loss through transmission gears is something to think about in addition to the preservation of the gears.

Diesels

DOUBLE THE ECONOMIC SPHERE of TRUCKS

IN the year 1934, the Federal Coordinator of Transportation published a merchandise traffic report, prepared by the Section of Transportation Service. The report deals with the conditions which have resulted from the development of competing agencies, for the transportation of merchandise, the nature, extent and effect of the competition and the respective spheres of economic utility of each transportation agency.

By the sphere of economic utility is meant the field in which rail transportation is superior to highway transportation, and contra, the field in which highway transportation is superior to rail transportation, in each case measured by the capacity of the instrumentality to produce serviceable transportation at the lower cost. The term "merchandise" was treated as embracing all property

TABLE III
Statement Showing Cost for Transporting Freight
for Distances of 200 and 400 Miles Between In-
dustries Located on or off Rail Spur Tracks via
Coast-wise Vessels

	Coast-Wise Vessels	
	200	400
1. Length of Haul (Miles)		
2. Tons carried	118,470	100,084
3. EXPENSES:		
4. Vessel	\$123,830	\$126,830
5. Cargo	184,658	155,819
6. General	113,104	103,726
7. Local Drayage	190,192	160,134
8. Total Expense	\$611,784	\$546,509
9. Total per Ton	\$ 5.16	\$ 5.46
*10. Total per 100 Lb. (Cents)	25.80	27.30

* Full cost and profit before federal income tax.



By C. G. ANTHONY, Vice-President
Pacific Freight Lines, Los Angeles, Cal.

TABLE IV

Statement Showing Relative Cost in Cents
Per 100 Pounds for Transporting Freight for
Distances of 200 and 400 Miles by Various
Transportation Instrumentalities

Length of Haul	200 Miles	400 Miles
Cost and Profit	Cents Per 100 Lb.	
Diesel Truck Costs to points on or off rail	13.14	24.29
Gasoline Truck Costs to points on or off rail	16.19	30.33
Rail Costs to points on Rail	16.31	24.58
Rail Costs to points off Rail	24.31	32.58
Coast-Wise Steamer Costs to points on or off rail	25.80	27.30

TABLE I

Statement Showing Rail Costs for Transporting Freight in 20 Ton Lots for Distances of 200 and 400 Miles Between Industries Located Both On and Off Rail Spur Tracks

Via Southern Pacific (Pacific Lines)	Rail Car
1. Length of Haul (Miles)	200 400
2. Net Load Tons	20.00 20.00
3. Tare Weight under load (Tons)	21.50 21.50
4. Tare Weight empty 25% (Tons)	5.37 5.37
5. Total Weight	46.87 46.87
6. Terminal Units	2 2
7. Gross Ton Miles	9374 18748
8. Car Miles, Empty and Loaded	250 500
9. Net Ton Miles	4000 8000
10. Operating Expenses:	
11. Terminal Units @ \$9.78	\$19.56 \$19.56
12. Gross Ton Miles @ 1.5133 Miles	14.18 28.37
13. Car Miles @ 2.144 Cents	5.36 10.72
14. Net Ton Miles @ .137 Mills	.55 1.10
15. Taxes	2.77 4.18
16. Return on Investment @ 54%	22.84 34.42
17. Total Cost Per Car	65.26 98.35
18. Total Cost Per Ton	3.263 4.917
*19. Cost per 100 Lbs. (Cents) From and to industries on Spur Tracks	16.31 24.58
*20. Cost per 100 Lb. (Cents) From and to industries off Spur Tracks	24.31 32.58

* Full cost and profit before Federal income tax.

TABLE II

Statement Showing Truck Costs for Transporting Freight in 20 Ton Lots for Distances of 200 and 400 Miles Between Industries Located On or Off Rail Spur Tracks

	GASOLINE Truck and Trailer	DIESEL Truck and Trailer
1. Length of Haul (Miles)	200 400	200 400
2. Average Running Speed	20 m.p.h. 22.5 m.p.h.	
3. Hours Worked Per Year	6000 Hrs. (380,000 Min.)	6000 Hrs. (380,000 Min.)
4. *Variable Charge per Mile	\$11415	\$0.07817
5. Round Trip Time—Minutes:		
6. Loading-Unloading-Delays	600 600	600 600
7. Running Time	1200 2400	1066 2133
8. Total Round Trip Time	1800 3000	1686 2733
9. Round Trips per year	200 120	216 131
10. Truck Miles per year	80000 96000	88400 104800
11. Tons hauled per year	6000 3600	6480 3930
12. Operating Costs per year:		
13. Fixed charges	\$2245 \$2245	\$2258 \$2258
14. Variable Charges	9132 10958	6754 8192
15. Depreciation	1616 1954	1813 2237
16. Drivers Wages 75c. per hour	4500 4500	4500 4500
17. Total Cost per year before profit	\$17493 \$19857	\$15325 \$17187
18. Add Profit (90% Operating ratio)	\$19437 \$21841	\$17028 \$19096
19. Cost per Ton	\$3.2395 \$6.0669	\$2.6277 \$4.8590
20.** Cost per 100 lbs. (c.) from and to industries on spur track or within zones of rail spurs	16.197 30.334	13.138 24.295

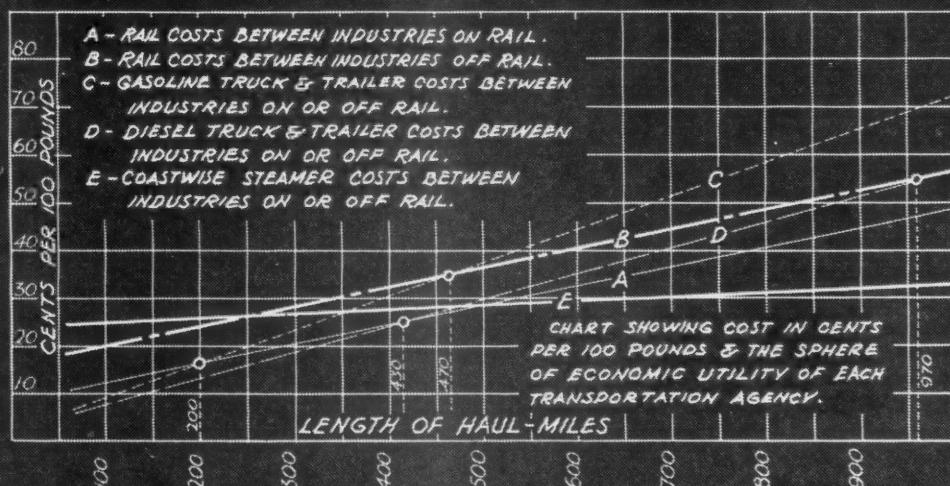
* Fuel, oil, maintenance and tire expense. ** Full cost and profit before federal income tax.

transported by carriers except milk, property shipped in carload lots, and property transported by pipe lines. The carriers whose operations were covered by the report include railroads, express companies, forwarders, water carriers and highway carriers.

The scope of the survey, in so far as it tended to determine the sphere of economic utility of rail and highway transportation, can be described, briefly, as follows:

IN 1932, the average rail LCL terminal cost was \$7.28 per ton of LCL freight originated. The highway common carrier terminal cost, including collection and delivery, was \$2.62 per ton originated, a difference of \$4.66 per ton, in favor of highway transportation. The 1932 rail LCL cost, other than terminal, was 3.084 cents per ton-mile, compared with the common carrier truck cost of 3.344 cents per ton mile—a difference in favor of the rail carrier of 2.60 mills per ton-mile. It would require an average haul of about 1800 miles for the

(TURN TO PAGE 68, PLEASE)



THE ABC'S OF MECHANICAL

By
HENRY JENNINGS
 Technical Editor,
 Commercial Car
 Journal

Fuel Pump

THERE is at best very little excuse for a truck's being delayed on the road because of fuel pump failure. About a \$25 stock of replacement parts will service even a fleet where the pump types are many and varied and about $\frac{1}{2}$ -hour per pump is sufficient for removal, rebuilding and re-installing. No skill is required that the average mechanic does not have—and very little knowledge. In most localities the pumps can be exchanged for prices that range around \$1.50 for small sizes and \$2.50 for the large ones.

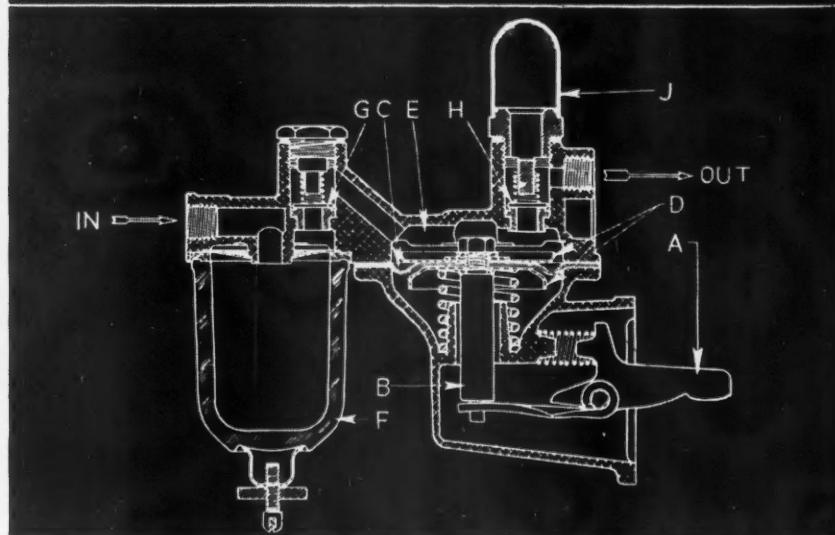
The only piece of special tool equipment necessary to rebuild fuel pumps is a simple hexagon box-type wrench which costs no more than the average open-end wrench. For accurate testing of the rebuilt pump there is available a piece of equipment for bench mounting that includes a vacuum gage and a pressure gage. This fixture sells for something under \$20.

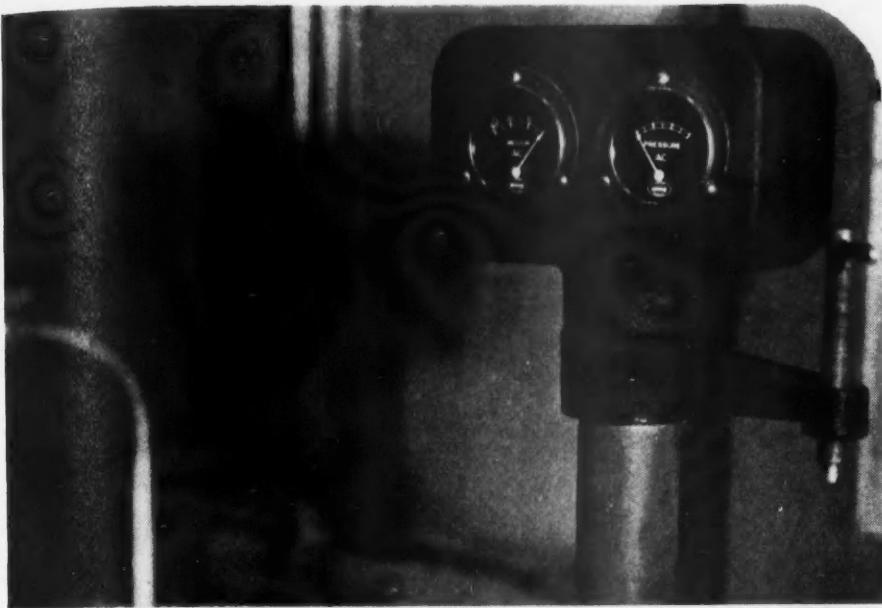
Mechanical fuel pumps vary somewhat in design but they are all relatively simple devices and so far as the shop man is concerned they are enough alike so that one model will not present problems to the man who has knowledge of and is experienced in other types. About five minutes is required to remove one from a vehicle, 20 minutes will be sufficient time to overhaul the average pump and another five minutes will see it back on the engine.

THE mechanical fuel pump is operated by a rocker arm A actuated from the engine camshaft. Opposite the

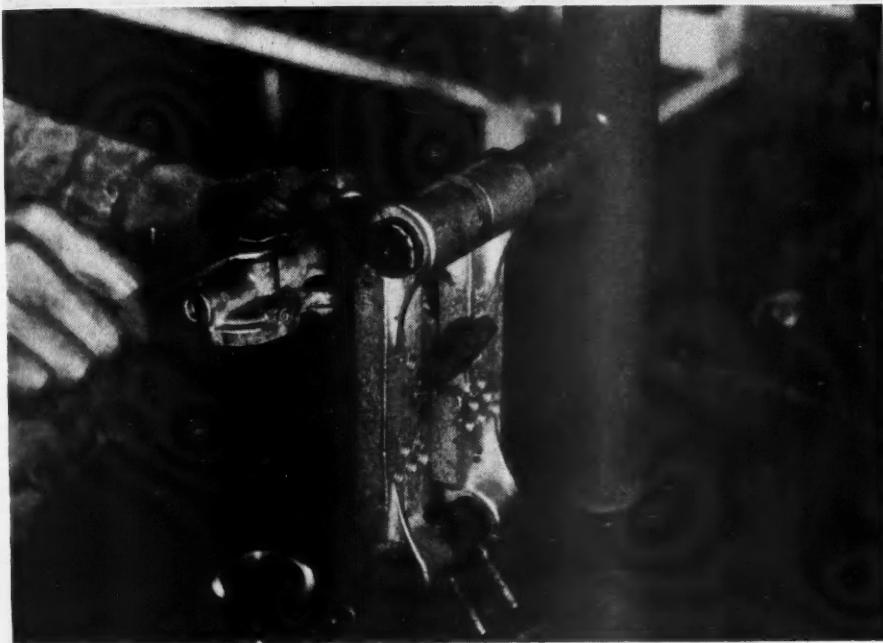
Rebuilding and Testing of a Mechanical Fuel Pump is Only a Simple 30 Minute Operation; Here Are the Complete Details

Below—Operating details of the mechanical fuel pump are discussed in the story. Opposite page—Accurate testing of fuel pumps is possible with this equipment which includes a vacuum and a pressure gage





MAINTENANCE



camshaft end of the rocker arm beyond the pivot the rocker arm is linked to a pull rod B which pulls the diaphragm C which is held between metal disks D downward against spring pressure. The downward movement of the diaphragm creates a vacuum in the pump chamber E.

Between the supply tank and pump chamber is a sediment chamber F and a spring loaded fibre G to brass seat inlet valve. The vacuum draws gasoline through the sediment chamber and through the valve and strainer into the pump chamber. On the return stroke the spring pressure forces the

diaphragm upward. Since the valve spring has closed the inlet valve coincident with the end of the vacuum stroke of the diaphragm the return stroke forces the gasoline through the only remaining opening through the exhaust valve H. The exhaust valve like the inlet is a spring loaded fibre to brass seat valve which prevents the suction stroke from drawing fuel already delivered to the carburetor back into the fuel pump. From the exhaust valve the fuel goes to the vapor dome J and from there to the carburetor.

When the float chamber of the carburetor is filled to its top level, natu-

rally the needle valve closes thus preventing delivery of fuel through the exhaust valve. With the pump pumping and no exhaust, naturally a pressure builds up in the pump chamber. To take care of this condition the rocker arm is made in two pieces. Thus the diaphragm is permitted to stay at the bottom position of the suction stroke in which stationary position it does not draw or deliver fuel. The camshaft end of the rocker arm follows the cam and the movement is absorbed at the joint in the rocker arm. There is a spring to insure constant contact between the rocker arm and the cam.

Any mechanical fuel pump should deliver 20,000 to 25,000 miles of trouble free service. Once or twice during that period the cover screws should be checked to make sure that they are tight and the sediment bowl should be removed occasionally and cleaned. Experience with operating conditions encountered will dictate the periods at which this should be done. At about 20,000 to 25,000 miles the fuel pump should be removed and rebuilt to prevent road failures. Certainly the low cost of preventive maintenance to this unit makes it a bad gamble to try to get the last useful miles from the fuel pump without a failure.

THE dis-assembly should begin with the removal of the cover plates which are held in place by machine screws. Before the plates are actually removed the plates and pump body should be punch marked so that the covers can be re-installed in their original position. The method of mounting and securing the rocker arm is somewhat different on the various models but upon inspection the method is obvious. With the rocker arm removed it is possible to remove the diaphragm and pull rod. The valves are usually held in place by cap nuts and these should be removed.

In every case of pump dis-assembly the diaphragm should be renewed. Diaphragms are the most common cause of pump failure. The next most troublesome points are the valves. The seats become dirty or worn or the fibre wears or gets swollen and misshapen. Doubtful valve parts should be replaced.

(TURN TO PAGE 46, PLEASE)

TEN COMMON Faults OF TRUCK DRIVERS

(1) Not concentrating on driving; (2) Not keeping to the right; (3) Turning too fast; (4) Carelessness in backing; (5) Slackness when fatigued; (6) Foot slipping off brake; (7) Day-dreaming; (8) Disregarding traffic signals; (9) Carelessness on icy streets; (10) Mechanical failures from carelessness

DURING the past seven months our company has been using a new method to control our truck accidents —taking snap-shot photographs of these accidents on the spot immediately after they occur; supplemented by other snap shots of our drivers taken while in action on the road at times when the drivers didn't know about it.

From a careful analysis of these accident and driving photographs, we have worked out a list of the ten "common faults" of our truck drivers; and we are now concentrating on an educational program among these drivers, trying to help them to control these worst driving faults. The practicability of our new plan seemingly has been proved by the fact that within 60 days after we began to take such photographs accidents among our 500 units had been reduced by 27 per cent as compared with the same period of the previous year; and regardless of the fact that the accidents for that previous year had already been cut 40 per cent under the year before through new com-

pany safety activities. Also, these truck accident photographs have been of great value in the adjustment of damage claims, or threatened damage claims from these accidents.

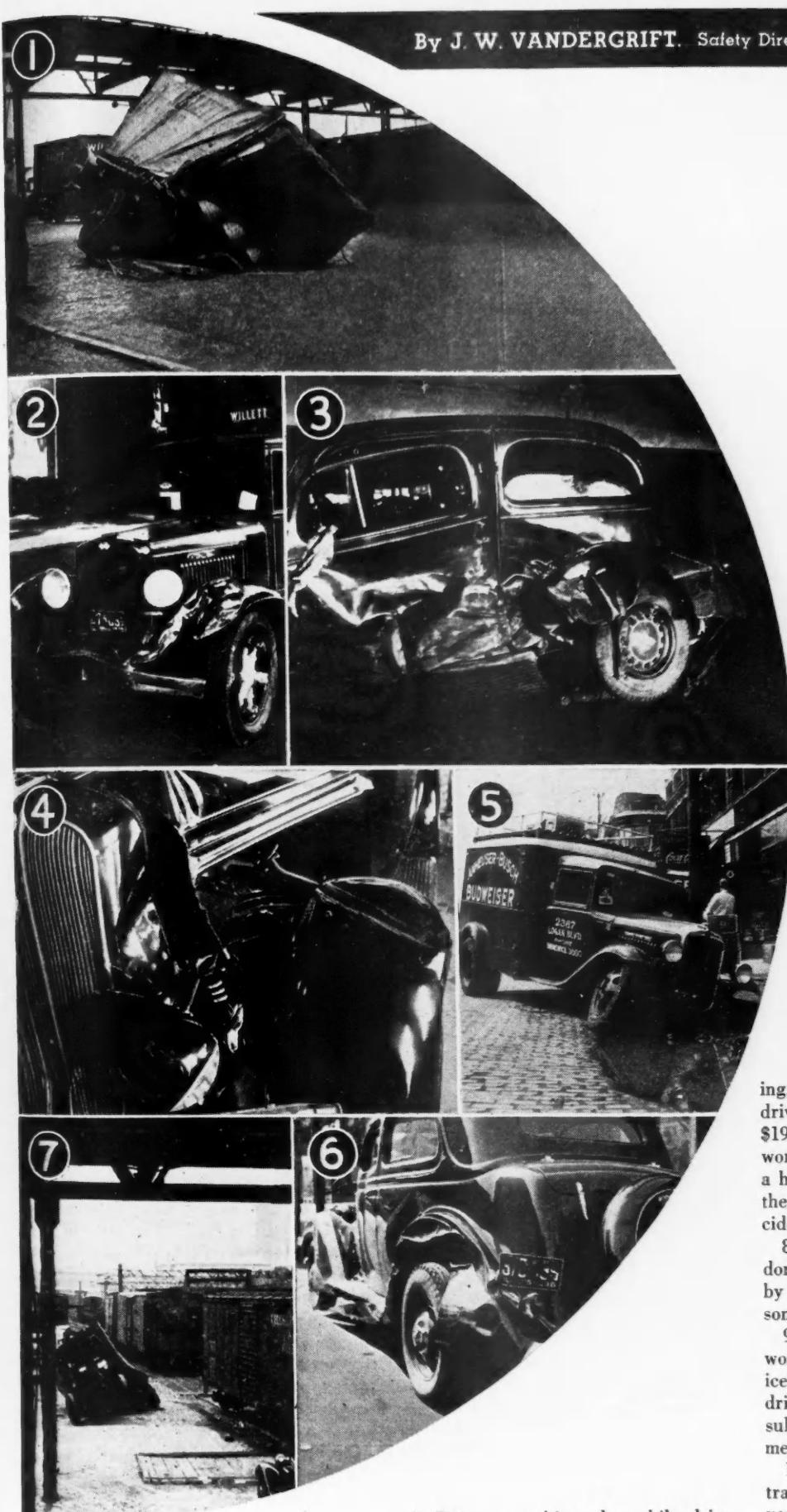
IN previous analyses of our accidents we have found a good many factors to consider. We usually have grouped these factors into headings such as the following: 1. The truck—mechanical condition; load condition. 2. The street—weather conditions; traffic conditions; "blind crossings," etc. 3. The driver—general health; skill; attention and fatigue; character, accident proneness; accident education.

But in our new accident control program we have been concentrating chiefly on one thing—the actual road habits of our drivers, as proved by our photographs of accidents and driving



habits taken on the spot. From these photographs I have worked out what seems to me the ten most common driving faults of our drivers. They are:

By J. W. VANDERGRIFT. Safety Director, The Willett Co., Chicago



1. Doing something else while driving. For example, glancing aside to reach into a pocket; to light a cigarette; to adjust a radio; to "spot"

pretty girls; to "cuss" another driver.

2. Not keeping to the right on right turns. This includes swerving out to the center line to get a wide curve; and a passenger car may slip up suddenly on the right side. In one such company accident, the rear of our trailer swiped the front of a passenger car—damage \$75.

3. Turning corners too fast. This may take the truck across the center to the other side of the street. Possibly a head-on collision and a serious personal injury.

4. Carelessness in backing up. Most frequent kind of minor accident; often damage to rear end and loading platforms; average cost \$50. Possibly a serious personal injury—if driver fails to look back just before starting.

5. Slackness when fatigued. Driver may be out late the night before; possibly a little drinking. Fails to allow for mental sluggishness, miscalculates distances. Remedy—more precaution.

6. Foot slips off brake. Probably in congested traffic with much shifting from accelerator to brake—and foot slips down between. Maybe bumps rear of another car. Remedy—"don't let traffic jams fuss you."

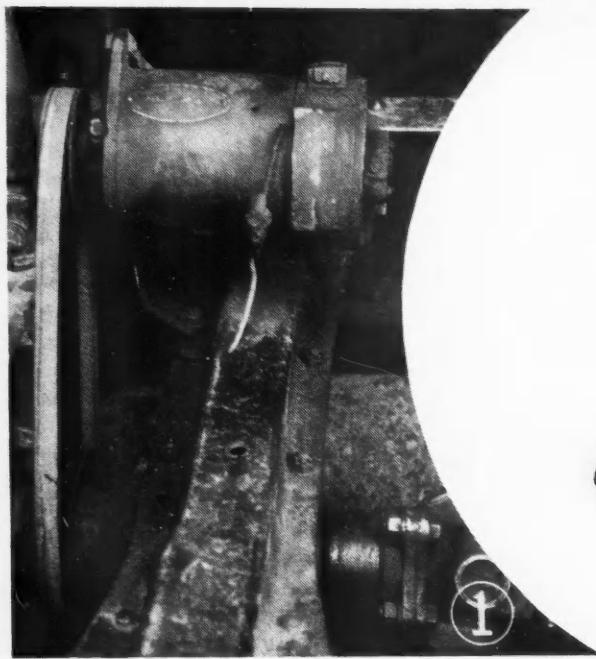
7. Day dreaming while driving. For example, an old company driver had two accidents, one costing \$190. Investigation showed he was worried about his boy, seriously ill in a hospital. Company financial aid and the boy's recovery changed his "accident habits."

8. Disregard of traffic signals. Seldom happens and brings "discharge" by our company. Possible costly personal injuries.

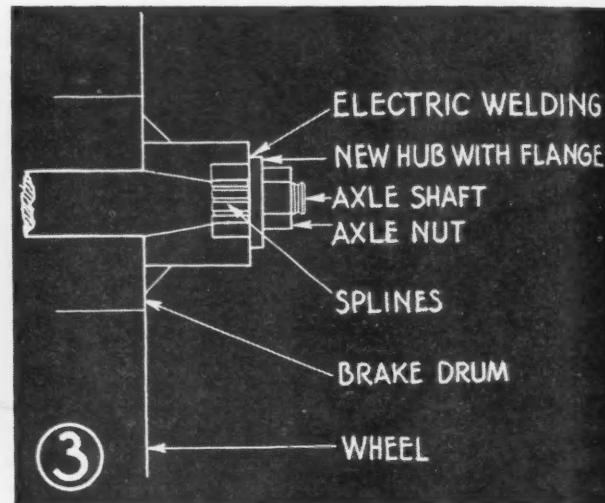
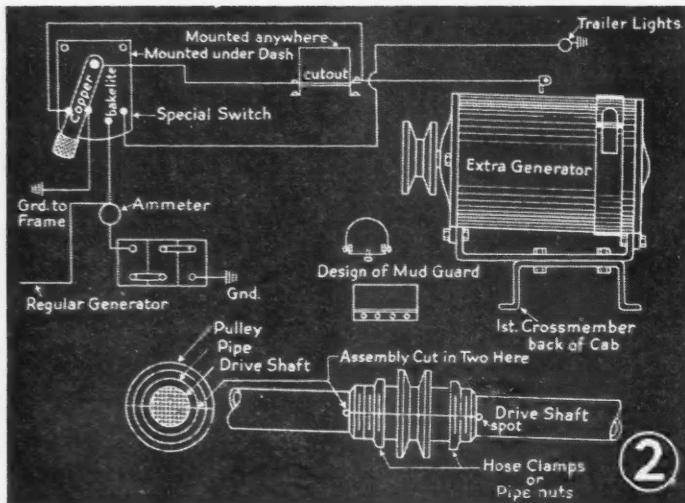
9. Carelessness on icy streets. The worst hazard is during last month of ice. Main highways are cleared, but driver forgets ice on side streets. Result—costly bumps to company equipment.

10. Mechanical failures, including trailers. No such accidents during two years of preventive maintenance program. Previously, two faulty trailer hook-ups cost \$200 each.

(TURN TO PAGE 62, PLEASE)



Shop FROM !



ONE of the very best shop hints that any editor has had the good fortune to accept came to COMMERCIAL CAR JOURNAL in time for this issue. Strangely enough it came double. From such widely separated points as Toledo, Ohio, and Salt Lake City, Utah, came descriptions showing how to mount a second generator on a truck to eliminate the trouble caused by the overload which comes with winter driving and these descriptions arrived almost simultaneously. Both of these descriptions are doubly interesting because they show how two practical fleet men with the same idea for eliminating winter battery troubles developed the idea.

1. 2. Extra Generator Installation By TED VOGT Ted Vogt Inc., Toledo, Ohio

EVEN though manufacturers are putting on oversize generators we still have

trouble with batteries during the winter. In order to overcome this trouble we mounted an extra generator on most of our trucks. After five years of experimenting we have found this arrangement that works. As a rule we use the extra generator and one battery of the regular size specified for the truck. The extra generator is mounted either under the hood and driven by a belt from the front of the engine, or as on some units which have a Hotchkiss drive we find it easy to install the generator back of the cab and drive it with a pulley on the drive shaft.

The pulley on the drive shaft is made by getting a pipe nipple or piece of tubing with the same inside diameter as the outside diameter of the drive shaft. Then chuck a Vee type pulley in a lathe and cut the hub out until it slips over the pipe nipple to the center and then weld it into place. See illustration (2).

After this is done cut the pulley in

half lengthwise so that there will be a half to go on each side of the drive shaft. If the drive shaft has a splined end in front, two pipe nuts can be used to hold the halves around the shaft but if it is not possible to get the nuts on the drive shaft, hose clamps will do just as well. The pipe is then spot welded in place, one spot at each end. This keeps the pulley from turning and makes it easy to remove when changing the unit.

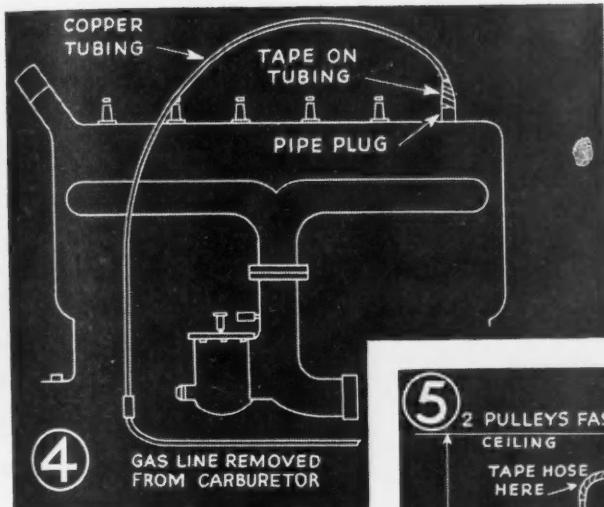
A metal cover to keep the mud and water away from the generator can be made very easily by mounting a flat tin with edges crimped up under the generator and running another piece over the top and bolting it to both sides of the crimped tin on the bottom.

A feature of this whole set-up is that no matter how much driving is done there will never be an overcharge of the battery due to a special switch. The switch is the knife type constructed

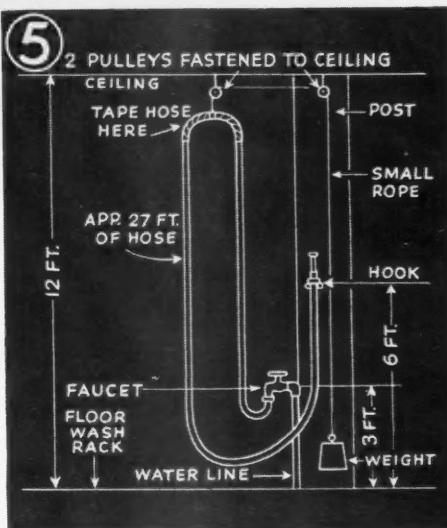
Commercial Car Journal Will Pay \$5 for Each Shop Hint Accepted. Ideas Count—No Matter How Rough. We Will Polish Them for Publication

Hints

FLEET SHOPS



Illustrations on these pages are of (1 & 2) Extra Generator Installation, by Ted Vogt; (3) Shop Made Hub, by F. W. Green; (4) Clearing Gas and Oil Lines, by Harry Metz; (5) Hose Rack, by Paul Killian



Extra Generator Installation

By M. R. GARBUZZ

Orange Transportation Co., Inc.,
Salt Lake City, Utah

LAST Fall we had a lot of trouble with our batteries and lights. Our trucks have two 32 candlepower headlamps, one 50 candlepower spotlight, one electric windshield wiper, one hot

so that when the trailer lights are on it cuts the generator in at the same time and when the lights are off the generator is grounded. Hence there is no problem of having the driver cut the generator out or in because it is automatic. Total cost of the installation never exceeds \$7.80. To install a new belt just drop one end of the drive shaft, which takes about 20 minutes.

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DECEMBER, 1936

water heater with illuminated switch, one dash light, one pair of electric horns that pull 22 amperes and 16 van lights and one tail light.

Twenty-one plate batteries could not stand the strain and the generator burned up trying to put out enough current. Installing special heavy duty armatures did not help much on the long night hauls during the winter.

I decided to install a second generator but was afraid that two generators throwing 35 amperes would burn up the batteries in daylight running. I overcame this danger in the following manner:

I bought reconditioned generators for \$6.50 each. Then I removed the armature and drilled the casing and installed in the hole an insulated post. Then I removed the grounded end of the field coil and attached it to the insulated post. The generator was then re-assembled and mounted on the engine.

The cutout was connected to the ammeter in the usual manner, a No. 10 gage wire was run from the ammeter to the starter to carry the extra current that will be carried to the battery. Then a wire was run from the insulated post to a separate pull and push switch on the instrument board and from the switch to a ground.

By pulling out the switch the field coil is grounded and the generator goes to work. By pushing the switch in, the circuit is broken and the generator stops charging. There is no danger of burning up the generator with this hook-up and when you need the extra current it is at the driver's fingertips. However, it is necessary to keep a close check on the water in the battery. It will take a lot of water and the level must be maintained above the plate top.

3. Shop-Made Hub

By F. W. GREEN
Oshkosh, Wis.

WE have some trucks in our fleet that splined rear wheel hubs and many times these splines have been sheered right out of the hubs and ruined the wheel. The normal remedy is to buy a new wheel.

However, buying new wheels is ex-

Shop Hints

FROM FLEET SHOPS

pensive, so we drilled out the wheel hub the length of the spline to a diameter larger than the depth of the splines. In this case it was to a three-inch diameter. A new hub was made locally that could be pressed into the old wheel center and a flange was left on the tailored hub so that the new hub could be electrically welded to the wheel. The new hub with duplicate splines cost about \$6 and when it was inserted in the wheel and welded into place the wheel was as good as new.

4. Clearing Gas and Oil Lines

By HARRY METZ

Erie County Highway Dept., Clarence Center, N. Y.

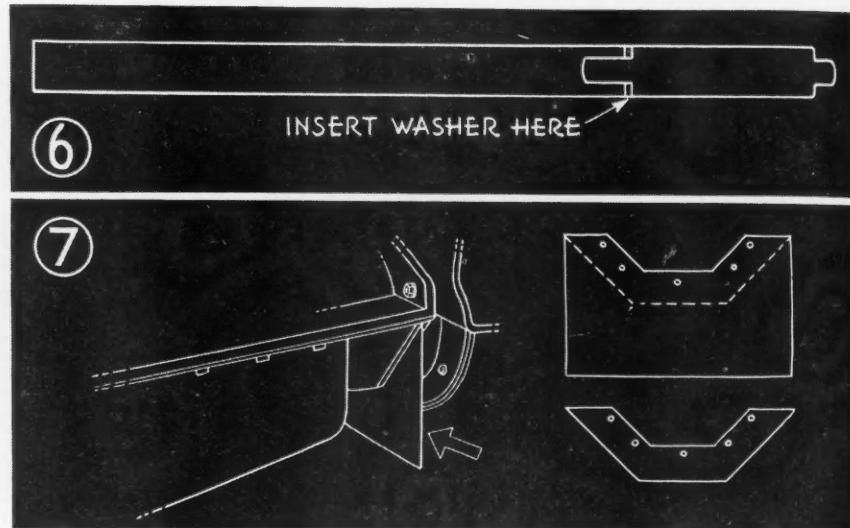
I HAVE a way of blowing out gas and oil lines while on the road where compressed air is not available. It can be done with a piece of 5/16 in. copper tubing about 5 ft. long. About 3/4 in. from one end the tubing is wound with friction tape for a seal. This end can be inserted in the hole in the cylinder head for the priming cup or if a priming cup is not used the spark plug hole. Quite a tight seal can be made if the tubing is wrapped the correct amount with friction tape. The other end can be connected to the gas or oil line with a union or held tightly with the hands. Have someone step on the starter switch with the ignition switch turned off and the cylinder compression will do all of the work.

5. Hose Rack

By PAUL KILLIAN

Killian Transfer Co., Liberty, N. Y.

IN our shop we have made an arrangement at the wash rack which keeps the hose clean and dry. The device also keeps it off the floor and in doing so eliminates the danger of



Illustrations above are of (6) Fuel Pump Maintenance, by Paul Hampp; (7) Oil Pan End Gasket, by Earl Conner

having it run over. This arrangement makes the hose last much longer even if it is not constantly being driven over.

The drawing shows how we apply a counter-weight and pulley to keep the hose in a convenient position. To use the hose the nozzle end is taken off the hook and can be pulled to any desired length. When finished the weight pulls the hose back up to the ceiling and only the nozzle end has to be replaced on the hook. The arrangement works especially well when washing a truck as the hose can be swung over the cab or body to the other side without it marring the paint. The hose should be taped for about two feet where the rope fastens to it to prevent a sharp bend in the hose. The weight should not be too heavy or it will pull too hard while using the hose.

6. Fuel Pump Maintenance

By PAUL HAMPP

Service Manager, Walton Baking Co., Toledo, O.

WE have found a way to cut fuel pump maintenance on the Ford V8's

in our fleet. Ordinarily when the linkage is worn the fuel pump is rebuilt and the parts are replaced. This can be done either in the shop or a rebuilt unit can be bought from the manufacturer.

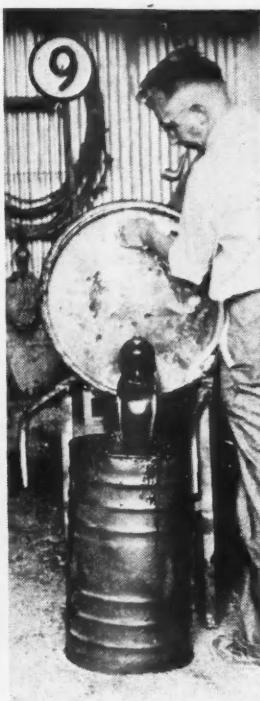
Instead of replacing parts I have been separating the capped end of the fuel pump push rod from the rest of the push rod and inserting a 3/32-in. washer. When the push rod is reassembled it can be seen that the play permitted by loose linkage has been taken up by lengthening the effective push rod. Fuel pumps so treated give us many more thousands of miles without replacing parts or rebuilding.

7. Oil Pan End Gasket

By EARL CONNER

County of St. Joseph, Highway Department, South Bend, Ind.

I HAVE a trick that eliminates a lot of trouble getting the oil pan end gasket in place when re-installing an oil pan that butts against a timing gear case or a flywheel housing. It is really



Above illustrations are of (8) Marker Light Installation, by A. J. Lombard; (9) Air Pump for Grease Barrel and (10) Folding Boom, both by Joseph C. Coyle

a hard job to get a leakproof joint when installing the oil pan with the engine in the vehicle. It is impossible to see what you are doing and about nine times out of ten the production gasket will leak because you cannot get hold of it and push it into place.

The regular gasket is shaped like the lower figure in No. 7. I make a gasket like the top figure from any suitable gasket material, making sure that the contours and holes line up perfectly with a regular gasket. This leaves me in effect with a gasket with a handle on it, and I can maneuver the gasket into its correct seat.

8. Marker Light Installation

By A. J. LOMBARD

Farquhar Trucking Co., Chicago, Ill.

PUTTING marker lights on some of these all-metal streamlined cabs is not as simple as it might be. Here is a method that I have found to give an insulated waterproof installation without too much labor on the installation.

Fourteen gage braided wire is inserted in $\frac{1}{4}$ -in. copper tubing and then the tubing is bent as shown in the illustration. At the cab roof a regular $\frac{1}{4}$ -in. tubing connection nut is used to connect the tubing with a union. Over this union on the outside of the cab roof goes a $\frac{5}{16}$ -in. plain washer filed to fit and between the washer and the cab roof is a piece of inner tube

cut to fit, all held in place by a nut on the union. The union goes through the cab roof and through a bushing, which in connection with another nut on the union, holds the whole assembly in place by making it possible to draw up on the union from the inside. Marine glue or cement can be used between the piece of inner tube and the cab roof.

Plier Grip on Anchor Lock

CLOSING the brake shoe anchor locks on the heavy duty Lockheed brakes is an annoying little job that frequently results in the loss of hide on the fingers. We have found a way of saving iodine and hide and at the same time speeding up brake work a little. The anchor lock is a horseshoe and on the outside surface near each end of the lock we grind a little notch with a bench grinder. These notches provide a good grip for pliers and when 8 in. pliers are used with a firm grip in these notches you are sure to get a tight lock.

9. Air Pump for Grease

By JOSEPH C. COYLE

Yuma, Arizona

TO empty viscous lubricant barrels air pressure can be used to good advantage. Cut a hole near the edge of a barrel head that can be clamped onto the grease barrels. Fit the hole

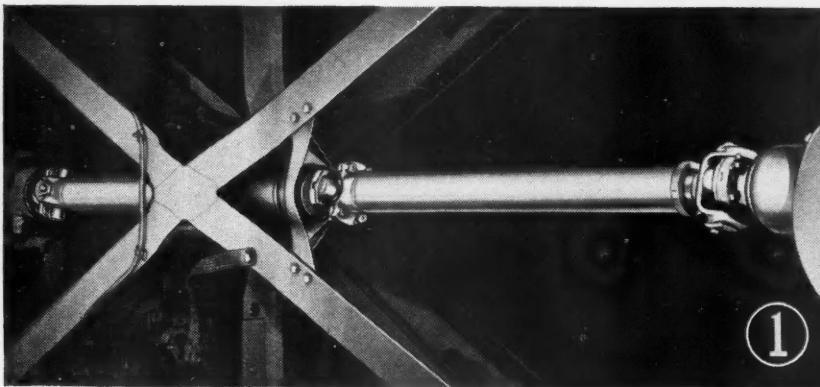
with a 12-in. section of 4-in. pipe and braze into place. Slope the outer end of the pipe so that the lubricant will flow readily and fit a slide gate to stop the flow as desired. At the regular metal bung insert a regular tire valve with a fitting to screw in the bung threads. Very little air pressure will be required to force out the grease.

10. Folding Boom

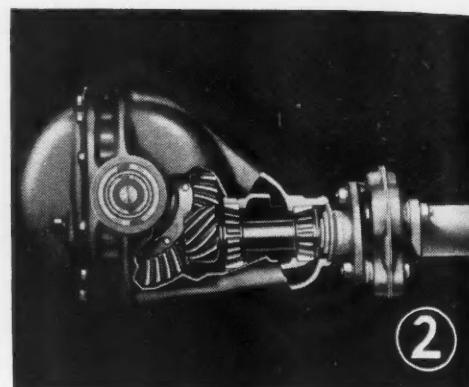
A FOLDING boom makes it possible to tow vehicles when one end must be raised, and to load heavy engines with only one man operating the service truck.

The hoist used for loading moves on the lower flange of a 2-in. by 4-in. boom, the outer end of which is hinged to the rear supporting bow, which is made of $1\frac{1}{2}$ -in. by 3-in. channel steel. It is reinforced at the top by a 2-in. bar welded inside the flanges. A heavy 8-in. hinge is used and wing gussets are welded to the hinge and to the boom. Several holes near the top flange at the back end of the boom are used to hook a chain leading to a clevis arrangement on the front end of the stationary boom. When not in use the back section folds back upon the stationary section and is fastened with a small bolt through the holes.

The lower ends of the bow are bolted to a triangular section of angle steel which is bolted to the frame.



1



2

CALLING ON ALL



FEELING that fleet operators are more interested in those phases of the automobile show that may affect fleet operation of fleet passenger cars or that portion of passenger car design that may find itself some day in commercial vehicles, the COMMERCIAL CAR JOURNAL representative did his best to resist being impressed by features which manufacturers have included in the 1937 cars to impress the casual buyer. Thus this article is one of trends rather than one of detailed descriptions of upholstery and door handles and should be interesting reading to the practiced eye of the fleet operator.

The most important trend in passenger car design for 1937 passenger cars is the deluge of hypoid gearing in rear axles. With only a slight warning from Packard and some Dodges in the 1936 cars, the hypoid axle becomes the most popular design for rear axles in 1937. The pinion engages the ring gear below the center of the gear on Buick, Cadillac, Chevrolet, Chrysler, DeSoto, Dodge, Hupmobile, LaSalle, Packard, Pierce Arrow, Plymouth and Studebaker cars. The purpose of the hypoid gear is to permit lower body heights, and lower overall in itself is an advantage. Flat floors made possible by the hypoid drive should accommodate salesmen's luggage and samples more conveniently. Outside of that there is no apparent advantage in the use of hypoid gears. There

To See What is in Them in the Way of New Mechanical Developments of Interest to Fleetmen

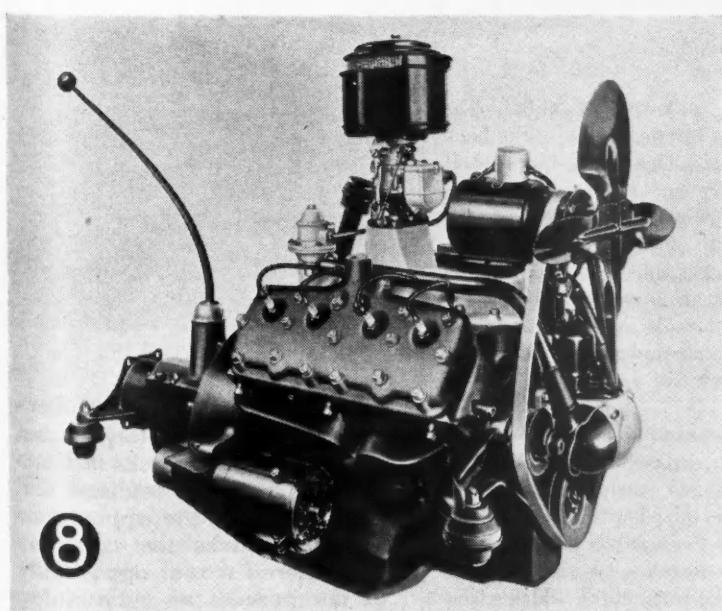
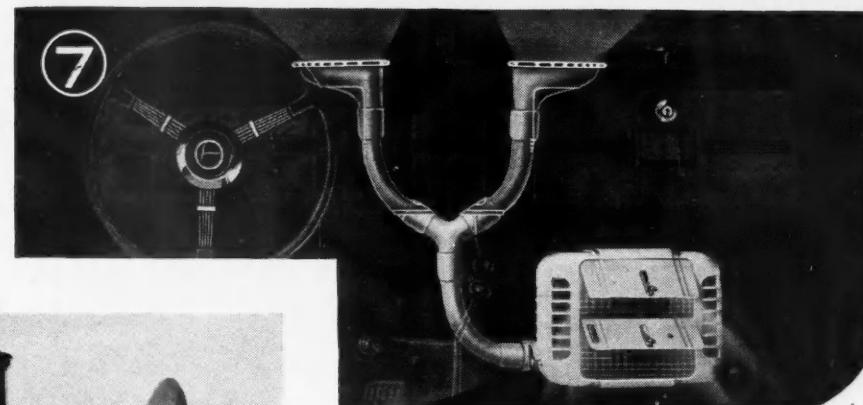
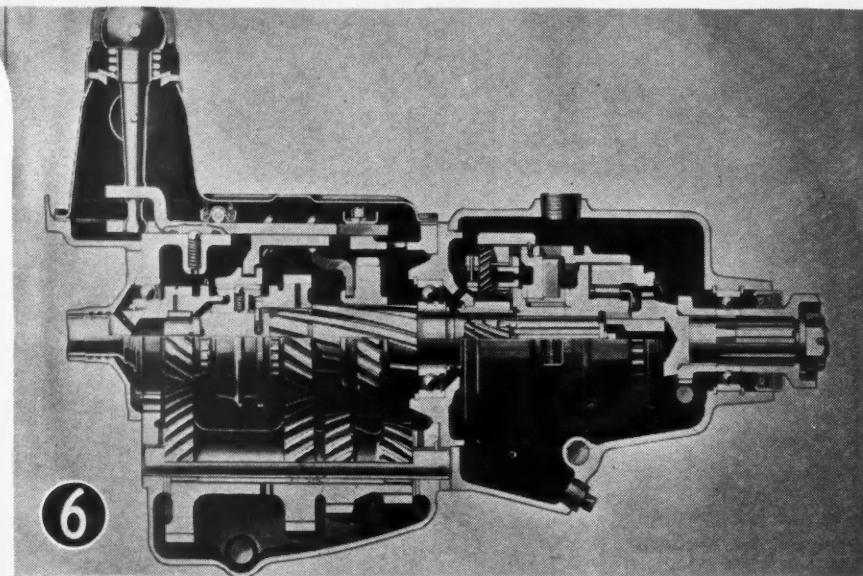
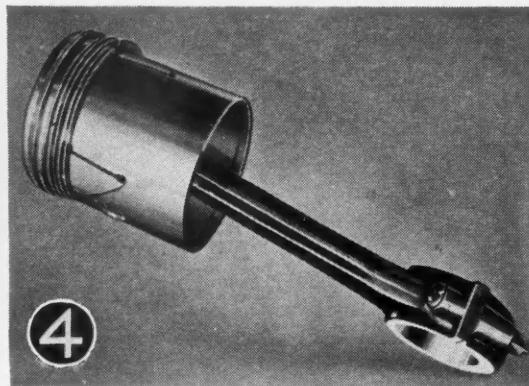
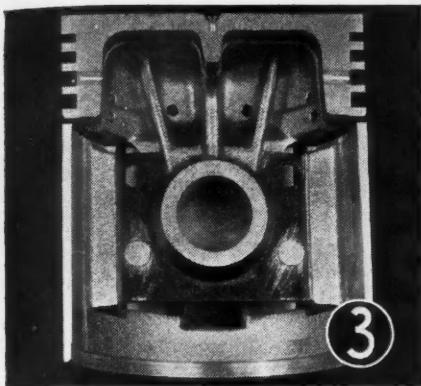
should be no additional service required as a result of the gears with the exception of more rigid attention to the lubricating program and recommendations.

To get the same effect as hypoid gearing would give so far as body height is concerned Oldsmobile and Pontiac have used two piece propeller shafts. The Olds design is the conventional use of two separate shafts with three universal joints, the center one being supported by a cross member bracket. In this particular case the support is the center of the X member. Pontiac uses a rigid extension of the transmission main shaft which reaches an anti-friction bearing supported by

a frame member. Behind this bearing is a universal joint which is the front joint on a conventional short shaft.

On the subject of axles it should be mentioned that independent front wheel suspension shows a gain. No car withdrew from the use of independently sprung front wheels this year. Chevrolet kept its split policy and has a conventional axle on the Master line which replaces the Standard line of last year. The new Packard six was born so to speak with independently sprung front wheels.

WILLYS has adopted a standard tread and made numerous other improvements which will put them in the



Illustrations of new mechanical developments on 1937 cars show (1) New type propeller shaft employing three universal shafts instead of the customary two. The rear section of the shaft only moves up and down. It is on Oldsmobile. (2) Cut-away showing hypoid gear detail. This permits a lower drive shaft—one of the achievements of the 1937 cars. Gear shown is Studebaker's. (3) Parallel strips of steel and aluminum control heat expansion of the piston skirt in the Autothermic piston used by Packard and Graham. (4) U slot piston offers better expansion coefficient. Used by Chrysler. (5) Slipper type, electro-plated piston of light weight used by Chevrolet. (6) The overdrive transmission is now being offered as standard on some cars and optional on others. This is DeSoto's. (7) Greater safety is assured by this efficient defrosting installation. Note duct detail and flow hot air. (8) The new Ford V8, 60 hp. engine for greater economy available with 1937 standard models

A SPRAY OF
Painting
 TRICKS
 THAT PULLS BEAUTY
 OUT OF THE PAINT POT

THE 22 trucks operated by Muller's Union Dairy, Rockford, Ill., are, I believe, a testimonial to the excellent paint practices used. Their appearance is all that a dairy would ask as well as all that the public expects of a milk delivery truck. The process of maintaining their appearance revolves around the method of refinishing, and contrary to some opinion to the effect that refinishing procedure is so conventionalized that there is nothing new in painting methods, we think our painting practices are interesting, and if conventional, they at least involve a few tricks which to our knowledge are not common practice. When COMMERCIAL CAR JOURNAL asked us to spill the dope on those paint tricks, we undertook to do so with the thought that other fleets would find them interesting. If only one hint is picked up by a fleet it may prove invaluable to that fleet.

Our trucks are finished in cream on body and hood and black on fenders, running board and radiator. Two green lines are striped in, running around the body. Moldings are striped in orange. Decals appear on both sides of the body consisting of the one word "Muller's" and beneath it a picture of a covered wagon. On a lower panel are the words "Rockford's Pioneer Dairy." On the side of the cowl appears a decal

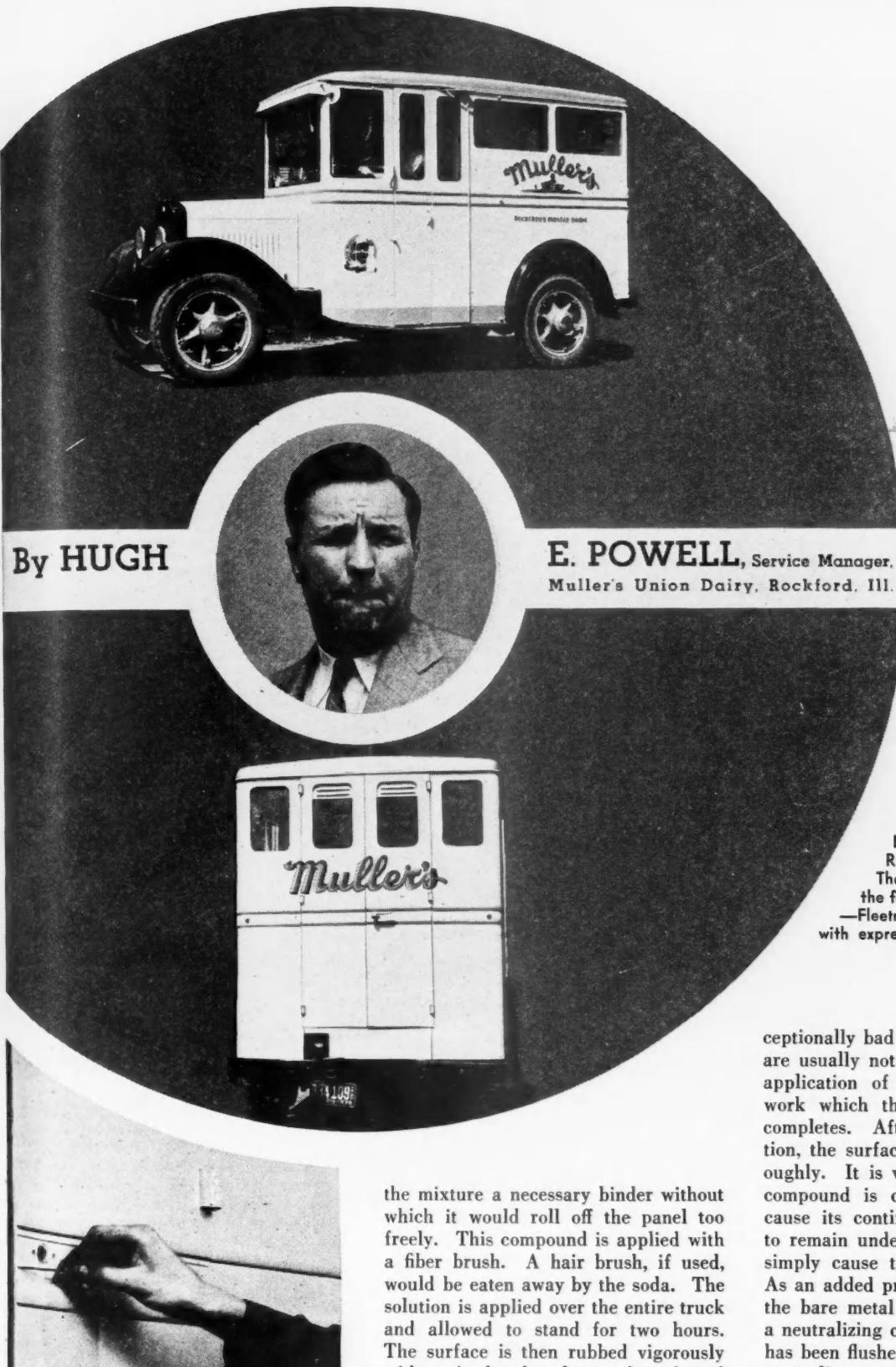
design with a bottle of milk. The word "Muller" appears across the back of each truck. This word, however, is lettered in by our painter and varies in size according to the size of the body.

To completely finish a truck in this pattern costs us approximately \$9 for paint, \$8 for decals and \$35 for labor. A complete strip-down-and-refinish job ties up a truck five days.

ON a strip-down job we use our own cold-stripping process which consists of a caustic soda wash. A gallon of caustic soda is mixed with three gallons of water. To the water is added half a box of corn starch. Caustic soda is added after the corn starch which gives



WHEN Muller's Union Dairy completely mechanized its fleet of trucks in October, 1934, it was realized that in maintaining the appearance of those trucks the company was offered a real opportunity in the process of maintaining



By HUGH

E. POWELL, Service Manager,
Muller's Union Dairy, Rockford, Ill.

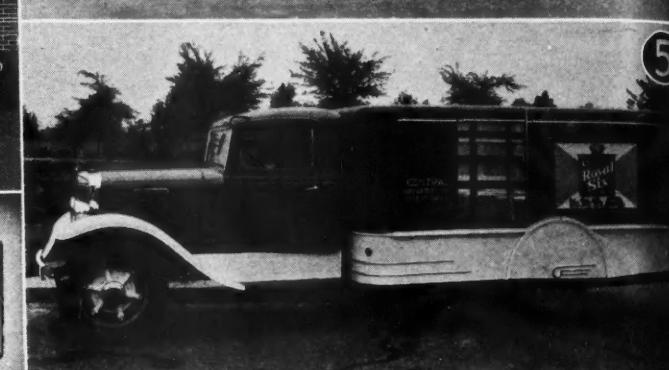
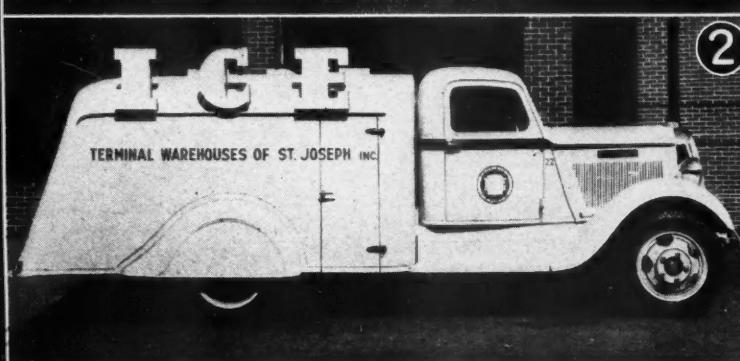
Photos on the left show side and rear views of a newly finished milk truck. Decals are used on the side. Rear lettering is by hand. The correct pose in striping the finish is shown below. Circle —Fleetman Powell: he tells his story with expression and feeling

the mixture a necessary binder without which it would roll off the panel too freely. This compound is applied with a fiber brush. A hair brush, if used, would be eaten away by the soda. The solution is applied over the entire truck and allowed to stand for two hours. The surface is then rubbed vigorously with a wire brush to loosen the softened paint, and it is then flushed off with a hose under ordinary house pressure. If the first application has not removed the old paint completely, a second coating of soda is applied. This second coat is allowed to stand over night, after which it is again rubbed with a wire brush. A putty knife should be used in corners and crevices and if necessary, a wire buffer takes care of ex-

ceptionally bad spots. These, however, are usually not resorted to as the first application of caustic soda does the work which the putty-knifing process completes. After the second application, the surface is again flushed thoroughly. It is very important that this compound is completely removed because its continued action, if allowed to remain under a new paint job, will simply cause that new finish to peel. As an added precaution, the surface of the bare metal should be treated with a neutralizing compound after the soda has been flushed off. A perfectly good neutralizer may be made easily and cheaply with baking soda and water. Half a box of baking soda (small household size) in three quarts of water are the proper proportions. Apply this neutralizer over the entire surface with a sponge and then rinse with the hose again.

We follow this up with a rust remover, mixed in water and applied
(TURN TO PAGE 78, PLEASE)

customer good will. This end was gained by the simple procedure of using a little paint at the right time in the right way. This is not uncommon. But the unconventional refinishing method is. There's a trick or two in it for you. Read the story.



1. TRACTOR TRAILER
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by KA
BODY
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ft. 5 in.

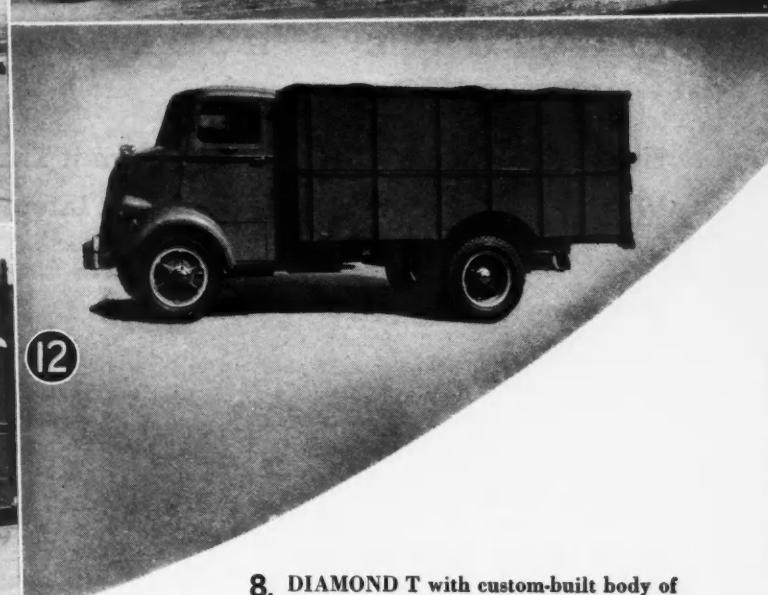
2. DODGE
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THE

Album



1. TRACTOR by CHEVROLET. Special ice cream body and semi-trailer built by KALAMAZOO SPECIAL AUTO BODY CO., Kalamazoo, Mich. Insulation by DRY-ZERO. Electric refrigeration unit by KOLD HOLD. Body is 21 ft. 5 in. long, 78 in. wide and 50 in. high.
2. DODGE chassis. Body by PRAWITZ-BAYER CO., St. Joseph, Mo. Insulation by DRY-ZERO. Loading is via roof hatch and door on curb side.
3. MACK trucks serve us coming and going. The closed job went to the Bilt Rite Baby Carriage Co., Brooklyn, N. Y. and the other went to the Boyertown Burial Casket Co., Boyertown, Pa.
4. BROCKWAY Model 78, 1½ to 2-ton chassis with special de luxe streamlined open delivery body also built by Brock-

way. Note de luxe fittings and side lights and chrome railing.

5. INTERNATIONAL Chassis Model C-30. Handsome streamlined stake body by KRANZ AUTOMOTIVE BODY CO., St. Louis, Mo. Body dimensions inside are: 10 ft. 3 in. long, 77 in. wide and 48 in. high. Operator: Central Breweries.
6. BODY by ADAM BLACK & SONS, INC., Jersey City, N. J. Camel-back chassis by REO. This "Circus Wagon" was built for Beech-Nut Packing Co. for an advertising tour.
7. LAPEER trailer. LeMOON tractor. Operator: Yellow Truck Lines, Inc., operating out of Pennoyer Merchant's Transfer Co., Chicago. This fully automatic, cab-controlled semi-trailer job is standard for Yellow Truck.

8. DIAMOND T with custom-built body of unusual design helps Flint Mercantile Co., Denver, strut its stuff. An open control aisle runs the length of the body with refrigerated compartments on both sides.

9. HIGHWAY trailer. GMC tractor. Semi-trailer is a Model 77-D upon which a Model 705 de luxe refrigerated body is mounted. Note the distinctive streamlined clearance lights on the side—created by Highway.

10. STEWART tractor. RELIANCE semi-trailer. CUMMINS HA diesel supplies power. Body dimensions inside are: 32 ft. long, 90 in. wide and 96 in. high. Gross weight is 60,000 lb. Payload is 17 tons. Operator: Luba Draying Co., San Francisco.

11. FRUEHAUF semi-trailer. INTERNATIONAL tractor. Operator: North State Transport Co., Fergus Falls, Minn.

12. STUDEBAKER cab-forward Model 2M225 of 1½ to 2-tons. Freight type body by EDWARDS IRON WORKS, South Bend, Ind. Loading space is 12 x 7 x 4½ ft. Wheelbase is 125 in.

Of Modern Truck Transportation Equipment

EDITORIAL COMMENTS

After Hours

BY GEORGE T. HOOK EDITOR

How Many Hours Will the I.C.C. Permit Truck Drivers to Work Per Day and Per Week in the Interest of Safety?

ON Nov. 19 the Interstate Commerce Commission held the first of a series of sectional hearings to determine what regulations should be formulated under the Motor Carrier Act with regard to hours of service of drivers to insure safe operation. The first hearing was restricted to bus operators, but it was important to truck operators because it served to indicate what sort of evidence the Commission hopes to get from them, and because it gave an inkling into organized labor's position.

This report, let it be understood, is less an attempt to familiarize fleet readers with bus matters than it is to indicate the course of events and to guide truck operators in the preparation of testimony most likely to make an impression on the Commission. Truck operators will have a number of opportunities to present their hours of service case. The first truck hearing will be held in Washington in January to be followed by hearings in various parts of the country.

THE bus witnesses at the initial hearing were unanimous in their opinion that they saw no relation between hours of service and safety—at least within the limits in which they were operating. They apparently felt that they were proving the contention by introducing evidence which showed that the majority of accidents occurred within the first few hours of driving and within the first 150 miles of operation. Experience of the Greyhound Management Corp. for

the first 10 months of 1936 showed that 65 per cent of the accidents occurred within the first four hours of driving. On a mileage basis, 74 per cent of the accidents occurred within the first 150 miles. For a two-year period 78 per cent of the accidents occurred within the first 150 miles.

These same witnesses testified that most bus drivers are not worked more than 9 hours per day. Greyhound testified that 79 per cent of its drivers worked 8 hours or less, and that the same percentage drove 200 miles or less per day. The American Transit Association, representing mass transportation bus services, showed that 149 companies reporting on 16,141 drivers worked 70 per cent of them 9 hours or less. (The hours include lay-over time and time allowances.) The same 149 companies reporting on 12,464 drivers showed that 85 per cent of them worked 54 hours or less per week. The experience of these mass transportation carriers indicated there was little difference in the safety records of companies working drivers under 8 hours per day and those working drivers up to 10 hours. Testimony showed that 12 companies working drivers under 8 hours per day had a 1935 record of 17.4 accidents per 100,000 miles. Fifty-five companies working drivers 8 to 9 hours per day, had 16.6 accidents per 100,000 miles, and 13 companies working drivers 9 to 10 hours per day had 16.8 accidents per 100,000 miles.

NONE of the witnesses made any recommendation as to what the maximum hours of service for bus drivers should be. Judging by the fact that very little of the evidence dealt with driving periods in excess of 10 hours, the bus industry would very likely be satisfied with that maximum for continuous service. A satisfactory non-continuous maximum might be 12 hours in 16. This might not please companies with so-called charter operations, but larger operators insist the same principles of safety should apply to all bus operators.

To this observer the bus witnesses appeared to be testifying free of pressure, secure in the belief that their operations were being conducted on a high plane of efficiency with which the Commission could find no fault and that their hours of service came well within limits commonly considered onerous.

CHIEF EXAMINER R. W. SNOW, who conducted the hearing, indicated that the testimony did not match his expectations. Particularly it failed to show the exposure period of individual drivers who were involved in accidents to reveal the relationship between the length of exposure and safety. There prevailed a feeling among men connected with the I.C.C. that the lumping of accident figures resulted in statistical averages which were not conclusive and therefore of little help. In response to point-blank questioning, the bus witnesses, while admitting there was a limit beyond which exposure was unsafe, were not prepared to say what that limit was. They were content to state that the limit must be in excess of the limits within which they were now operating. They were also unanimous in declaring that rest periods were important, and that it was more important that the driver really take the rest.

THE testimony of bus operators did not furnish representatives of organized labor with fuel to build any fires.

Charlton Ogburn, general counsel of the Amalgamated Association of Street & Electric Railway & Motor Coach Employes, affiliated with the American Federation of Labor, spoke the mind of neutral observers when he said that the evidence introduced was not very helpful in aiding the Commission to reach a determination of the question. But he followed this with a line of argument which indicated that labor was not seeing "the question" eye to eye with the Commission.

The public interest in hours of service, Mr. Ogburn said, required the Commission to take into consideration factors other than safety. The relation-

(TURN TO PAGE 59, PLEASE)

NEW FORD TRUCK PRICES

Prices at Dearborn Plant. Taxes, delivery and handling, spare tire and accessories extra. Bumpers extra on commercial cars only.

COMMERCIAL CARS 60 H. P. 85 H. P.

	60 H. P.	85 H. P.
Chassis	\$360	\$370
Chassis with cab	450	460
Pick-Up	470	480
Stake	500	510
Panel	560	570
Sedan delivery	585	595
Station wagon	*	680

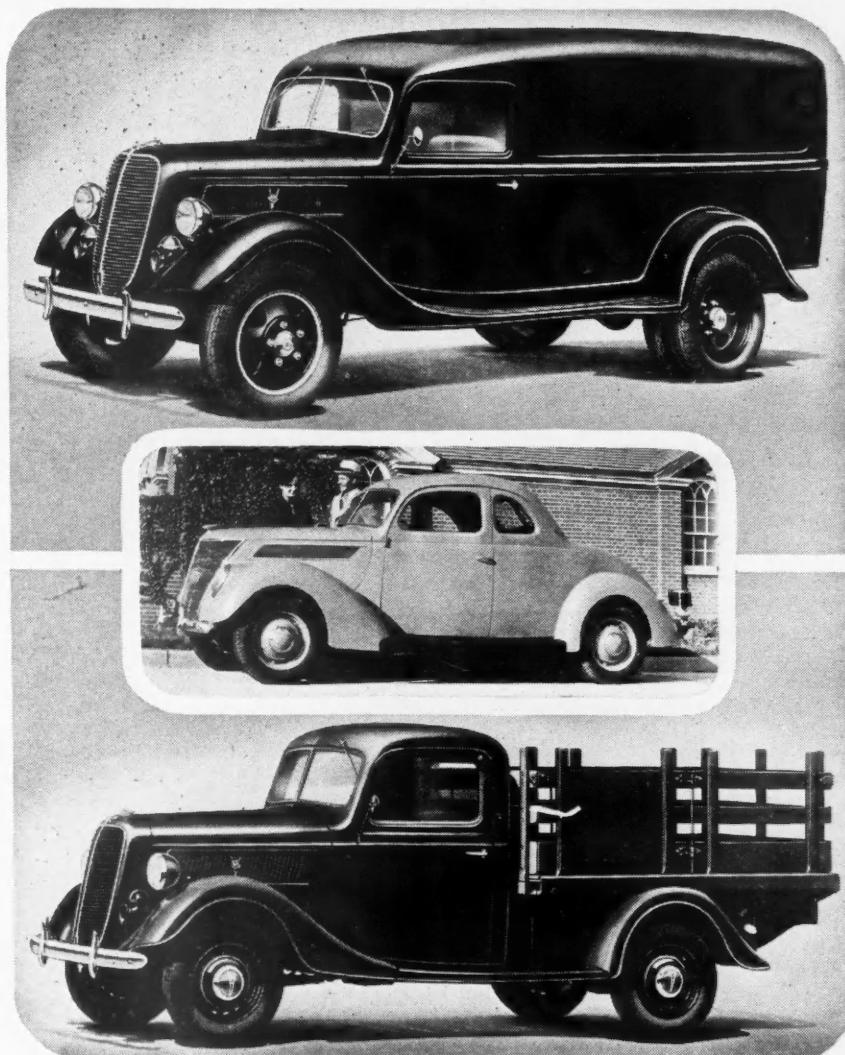
13 1/2-IN. TRUCKS

	60 H. P.	85 H. P.
Chassis	\$495	\$505
Chassis with Cab	585	595
Stake	665	675
Platform	640	650
Panel	760	770
Dump	*	810
Dump chassis	*	520
Dump chassis with cab	*	610

157-IN. TRUCKS

	60 H. P.	85 H. P.
Chassis	*	\$530
Chassis with Cab	*	620
Stake	*	730
Platform	*	685

*Not available with 60-horsepower engine.



Top—13 1/2-in. wheelbase panel body Ford delivery. Bottom—157-in. wheelbase, 1 1/2-ton chassis with stake body. Center—The 1937 business coupe. Both the 85 and the small 60 hp. engines are available with these models

Ford

THE Ford line of trucks and passenger cars for 1937 is featured chiefly by a choice of power plants. In addition the 85 horsepower engine which remains essentially the same as the 1936 engine there is a 60 horsepower engine of 135 cu. in. displacement. The bore of the small engine is 2.6 in. and the stroke is 3.2 in. It is a V-8.

The crankshaft of the big engine has been increased somewhat in size and weight and the compression ratio has been increased to 6.12. The compression ratio of the small engine is 6.75

FIRE 1937 COMMERCIAL LINE WITH 60 and 85 HP. ENGINES

to 1. A new type of alloy piston is used in both engines and the connecting rod and piston assembly of the large engine have been made lighter. Main bearings in the large engine have been increased to 2.4 in. in diameter and the main bearing diameter of the small engine is 2 in. Both engines have live rubber mountings.

Water pumps are now located at the

bottom of the block and the cooling system has been redesigned to increase its capacity. Pumps on the large engine incorporate two sealed pre-lubricated bearings while the pumps on the 60 horsepower engine are lubricated automatically from the timing gear case. The fan has been re-designed to provide greater fan blast on less power.

(TURN TO PAGE 60, PLEASE)

New Products

ON PARADE

Van Norman Equipment

THE Smallest cylinder to the biggest cylinder is the range of reconditioning with a Per-Fect-O Boring Bar. The Van Norman Machine Tool Co. of Springfield, Mass., manufactures six sizes of boring bars, for all cylinders from 2.2 in. to 9 in. in diameter, from 10 in. to 30 in. deep. The Per-Fect-O is the bar with the four catpaws that not only center the bar, but guide and support the flycutter all the way down the cylinder, preventing any chance of chatter, vibration or weaving, and precluding any need for honing or for a second cut. Regardless of cylinder condition, one cut prepares it for fitting pistons and rings.

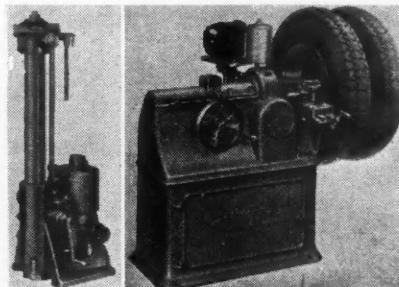
The Senior Brake Drum Lathe manufactured by the Van Norman Machine Tool Co., Springfield, Mass., is the only machine of its type with a multiplicity of variable feeds ranging from .002 in. to .025 in. Another feature is the hollow rotating spindle that slides in and out of the casting, providing easier access to the interior of the drum. This feature also means that work is supported directly at the end of the spindle, an advantage using many special arbors and spacers. It also makes possible the use of a grinding attachment.

Bearing Replacement Tool

WITH the new camshaft bearing replacement tool designed and produced by the Federal-Mogul Corp., Detroit, Mich., replacement of the new-type camshaft bearings can be accomplished on a Ford V-8 engine in nine minutes flat, and that includes removal of the worn bearings. The tool will soon be available for Chevrolet.

The new tool which makes this service operation easy and economical, consists principally of a draw bar, draw bar nut, housing, guide plug, backing plate and alignment rod. To remove a worn bearing, the guide plug's small diameter is inserted in the bearing. The draw bar, with housing and nut, is pushed through the guide plug, the guide plug washer and the backing plate are slipped into place and the alignment rod inserted in a notch at end of draw bar. This rod simply keeps the bar from turning.

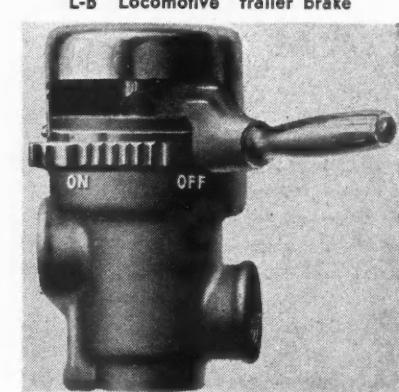
By turning the draw bar nut with any wrench of the proper hex size, the old bearing is pushed out. To insert a new



V-N boring bar and drum lathe



Goodrich Seal-O-Matic tube



L-B "Locomotive" trailer brake



bearing, the Dualoy bearing is placed on the guide plug, and the large diameter end of the plug inserted in the crankcase bore, making sure oil holes are lined up. Turning the draw bar nut presses the bearing into place.

Seal-O-Matic Tube

A PATENT covering an inner tube which seals punctures in tires while the car is in motion has been issued to The B. F. Goodrich Co., Akron, Ohio. The puncture-proof inner tube is made with a layer of plastic self-sealing composition on the inner side of the tube. Holes are closed without loss of air when the penetrating object is removed. The tube is known as the Seal-O-Matic tube. It is moderately priced.

Locomotive Brake Control

THE basic control element in the Lathan-Besler, Inc., San Francisco, Cal., "Locomotive Control" of trailer brakes is the Series 31 balanced hand valve pictured here. Installed in the cab, it permits the operator to apply and maintain any desired brake power by simply positioning the handle accordingly. A quick action, sliding-sleeve type valve, of ample capacity for largest multiple installations. Automatically compensates for pressure fluctuations. Efficient air cleaner embodied in construction. Adaptable either for direct or remote control of power chamber in air suspended, vacuum suspended, or split installations.

L-P Equipment

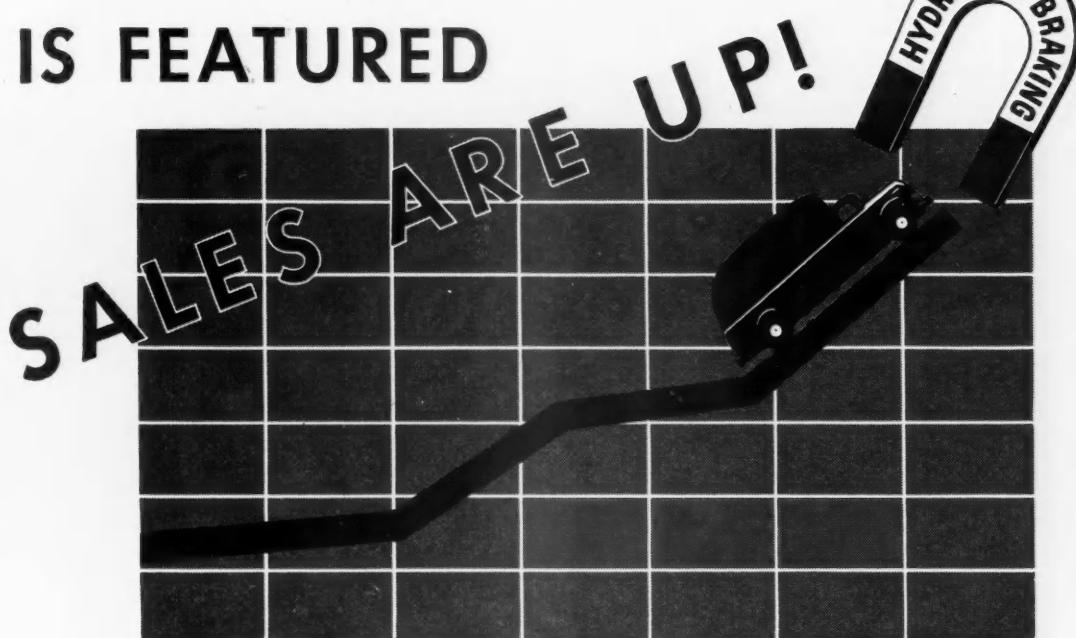
LANTZ PHELPS CORP., Dayton, Ohio, announces a precision voltmeter consisting

[More Products Page 93]

SIGNIFICANTLY ENOUGH... WHERE

Hydraulic Braking

IS FEATURED



UNDoubtedly, there are other reasons for certain trucks forging toward the front. But certainly it is significant that every single make of truck featuring Hydraulic Braking is showing impressive sales gains.

More and more operators are demanding hydraulic brakes in the trucks they buy. More and more operators realize that these great

brakes are thoroughly reliable—require very little attention — retain their adjustment for exceptional periods—need no lubrication and provide an easy, gentle pedal.

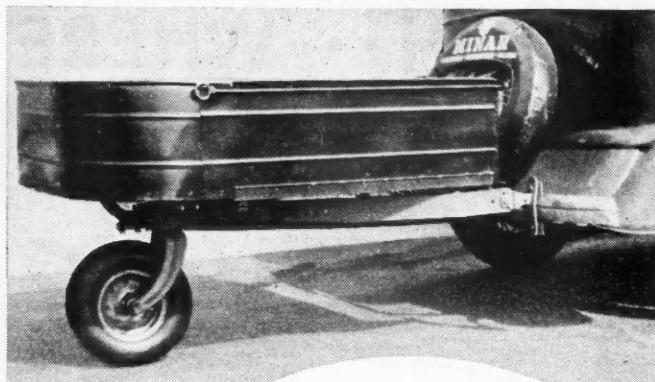
Sound reasons, those! And easy to understand. We predict—but need we predict? We think you *know* what the future holds for hydraulic brakes.

HYDRAULIC BRAKE COMPANY
DETROIT, MICHIGAN

LOCKHEED HYDRAULIC

Four BRAKES Wheel

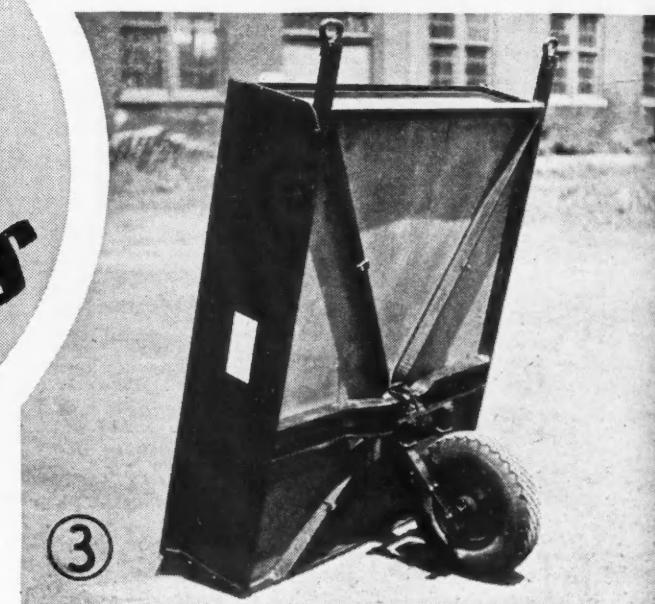
OFFICIALLY SERVICED THROUGHOUT THE NATION BY WAGNER ELECTRIC CORPORATION
COMMERCIAL CAR JOURNAL
DECEMBER, 1936



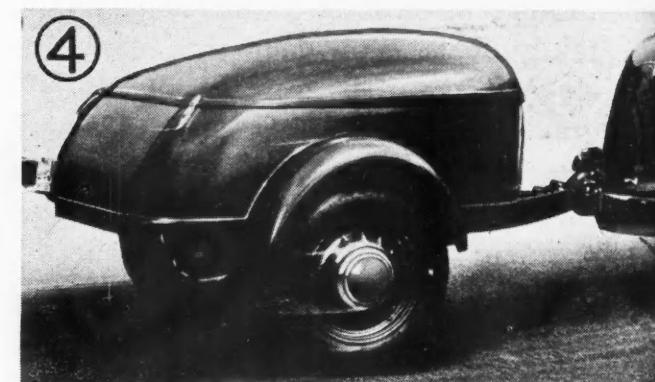
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RECENTLY a number of inquiries were received from fleet operators asking us about the availability of one-wheel trailers for such use as keeping tools and parts in them when a mechanic goes out on a road call. We printed an SOS via the pages of COMMERCIAL CAR JOURNAL for information on such units and the manufacturers represented on this page responded ere the ink was dry. Available to fleetmen are chassis alone or with different type bodies to suit their fancies.

1. **FEDERAL PRODUCTS CO.**, Minneapolis, Minn., has the Rollaway One-Wheel trailer with different type bodies available. The Model 506 is all-steel enclosed with top sides rounded. Body dimensions are 46 in. long, 42 in. wide and 30 in. high. Model 500 is the open box type. Dimensions are 54 in. long, 42 in. wide and 11 1/4 in. high. The canvas top trailer is model 504. The chassis is available alone and is designed for 500 lb. capacity. An alloy steel leaf spring is incorporated for body mounting.
2. **ANTHONY CO., INC.**, Streator, Ill., offers the spring cushioned fork, single wheel type trailer easily attached to the bumper brackets by means of towing hitches rubber-mounted to prevent them from rattling. The single wheel is mounted on a fully enclosed steel spindle that operates in oil. The Anthony square type flare body is 51 in. long and 42 in. wide. Total depth is 11 1/2 in. Other types available are the round end trailer, the canvas covered top, the square platform unit, etc.
3. **INDESTRUCTIBLE WHEEL CO.**, Lebanon, Ind., features the Handy Trailer. This is the one-wheel type easily attached to the bumper. The No. 1000 trailer has an all-steel
4. **MULLINS MFG. CORP.**, Salem, Ohio, has an all-steel, trailer mounted on two standard automobile wheels and has the standard tread of 56 1/2 in. The trailer is of streamlined design. Capacity is 1200 lb. It will accommodate parts, merchandise, baggage, displays and may also be converted into sleeping quarters.

body 54 in. long, 42 in. wide and 10 in. high set on a channel frame. Some of the features are: two 3-leaf steel spring forks; tire bearings assembled so that removal of the wheel does not disturb the bearing assembly, low platform height and alemite fittings.

FOR SALE

ONE PAIR OF ROSE-COLORED GLASSES!



"ROSE-COLORED GLASSES!" You can have 'em! I looked at oil costs through 'em—and got an all-American headache as a result!

"Saving a cent or two a gallon by using cheap oil in my fleet made a mighty pretty picture. I went around clapping myself on the back—until suddenly my shop foreman popped up and handed me the jolt of my life!

"He gave me a fistful of facts about repairs and overhauling that kicked my rosy little picture right into the middle of next week!

"That cheap oil I'd bought was making him shovel carbon out of the cylinders. The crankcases were full of sludge and gum. Bearings were getting as hot

under the collar as the men who were working overtime to repair them. And on top of that, the low mileage we were getting made me grit my teeth!

"That's why I switched to Gulflube. It's the only oil in the world that gives you premium protection and performance—yet doesn't charge you a premium price. And Gulflube is the reason I've quit running a temperature every time I think of maintenance costs."

Gulflube is truly premium-quality oil at a non-premium price. It owes that premium quality to Gulf's exclusive Multi-sol refining process, which chases carbon and sludge-forming compounds right out of the picture. Gulflube holds its body under heat—yet flows freely in

cold weather—and has an extra high viscosity index.

Mail the coupon below and get the complete story of how this oil can save you money. Do it today.

HERE'S AN OFFER
THAT MEANS BIG MONEY
TO YOU!

CCJ-126

GULF, 3800 Gulf Bldg., Pittsburgh, Pa.

Gentlemen:

I should like to get the complete money-saving story on Gulflube.

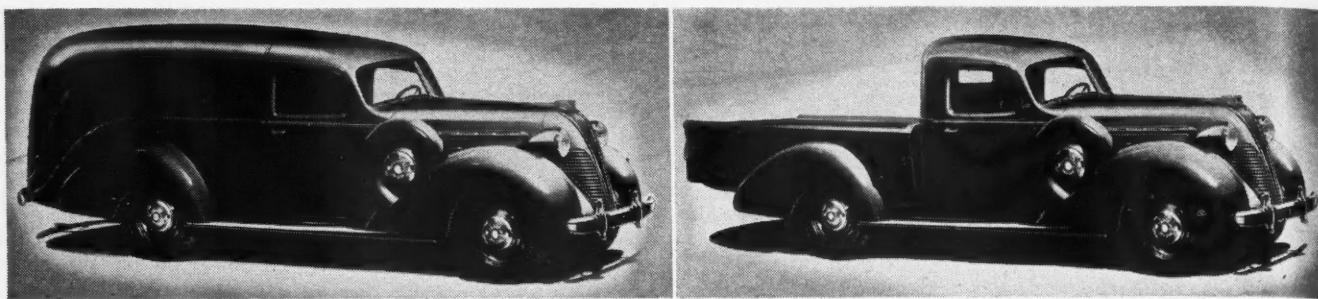
Name. _____

Address. _____

City. _____ State. _____

GULFLUBE
MOTOR OIL





Terraplane 3/4-ton panel delivery (left) and 3/4-ton pick-up express (right) on 117-in. chassis.

Terraplane Has 5 Models in 1937 Commercial Line

HUDSON MOTOR CAR CO. is now offering a line of Terraplane commercial cars on a 117-in. wheelbase chassis. It consists of a 3/4-ton panel delivery, a 3/4-ton pick-up, a utility coach, coupe pick-up and station wagon.

Frames of the commercial car chassis are of new double-drop 2X type. Its side rails are 7 1/8 in. in depth and there are two X-members and additional transverse braces. The design of the frame is said to be such as to give an unusually low center of gravity.

This chassis is powered with a 96-hp. Terraplane engine, a heavy-duty trans-

mission, and an "over-size" rear axle. There are two roller bearing universal joints and direct-action, two-way shock absorbers in the front. Duo-automatic hydraulic brakes are standard.

The panel delivery has a capacity of 1500 lb., the same as the 3/4-ton cab pick-up express. The load space in the latter is 85 in. long by 47 1/8 in. wide and 16 1/8 in. deep. The box body has steel lockers on both sides.

The utility coach looks like a passenger car of advanced styling and can be used as such. But the back seat lifts out, providing a carrying space of

113.6 cu. ft. with 1000 lb. cargo capacity. It is closely paralleled by the utility coupe, which also has an exterior appearance resembling a passenger car, but which can be converted quickly into a utility pick-up with a box type body behind the front seat. The length of the rear compartment is 66 1/4 in., the width 48 in., and the height 26 in. Total capacity: 44 cu. ft.

Several new features are incorporated in the station wagon for 1937. It has a capacity of seven passengers besides the driver. When used for baggage, etc., it has a useful space of 85 1/2 in. by 56 in. from dash to tail gate.

All of the commercial cars are available with the "Electric Hand," and where greater horsepower may seem desirable a high-compression cylinder head, which increases the output to 102 hp., is available at extra cost.

New Truck Registrations by Makes by Months

	Autocar	Brockway	Chevrolet	Diamond T	Dodge	Federal	Ford	G. M. C.	International	Mack	Reo	Sterling	Stewart	Studebaker	White-Indiana	Miscellaneous	Total
January.....1936	75	94	15,124	495	6,207	223	14,606	428	4,743	90	339	8	85	143	493	607	43,760
January.....1935	71	86	9,867	550	5,141	152	13,260	858	3,513	114	380	10	42	127	308	280	34,759
February.....1936	57	88	14,978	510	5,556	170	12,226	758	4,365	107	217	4	62	134	408	661	40,301
February.....1935	41	54	11,701	499	3,271	113	14,330	570	3,174	63	292	10	34	107	217	321	34,797
March.....1936	88	127	19,511	634	6,753	205	16,168	1,551	5,395	184	264	17	73	221	477	762	52,430
March.....1935	56	67	13,744	534	4,284	132	16,805	850	3,673	100	389	14	60	135	258	410	41,511
April.....1936	121	179	23,323	784	8,818	271	18,493	2,733	7,308	289	379	21	112	327	700	1,099	64,957
April.....1935	79	109	15,024	568	5,708	177	17,943	870	4,554	159	449	31	62	189	309	554	46,785
May.....1936	109	168	21,443	754	8,507	275	17,971	3,045	6,704	440	399	16	116	358	719	1,159	62,183
May.....1935	78	97	16,284	570	5,381	193	17,591	883	4,807	189	616	5	60	229	294	691	47,968
June.....1936	96	137	19,045	660	7,777	287	16,930	2,820	6,151	427	325	28	113	320	599	1,136	56,851
June.....1935	73	113	17,576	572	4,911	178	17,385	901	4,710	103	439	16	69	218	258	721	48,243
July.....1936	137	207	21,553	846	8,153	280	18,639	3,501	7,167	492	382	22	132	361	748	1,075	63,695
July.....1935	99	114	18,608	593	5,336	202	18,073	857	5,308	147	439	19	85	219	336	808	51,243
August.....1936	139	163	20,931	801	8,298	251	16,426	3,070	6,314	434	322	39	126	320	635	953	59,222
August.....1935	91	143	18,554	591	5,723	219	16,429	1,312	5,231	145	476	9	94	264	354	720	50,355
September.....1936	124	138	15,589	826	7,957	244	17,044	3,209	6,640	424	521	17	141	327	645	765	54,611
September.....1935	75	106	13,271	529	5,635	196	13,715	1,307	4,963	81	385	9	90	167	350	511	41,390
Nine Months.....1936	946	1,301	171,497	6,310	68,026	2,206	148,503	21,115	54,787	2,887	3,148	172	960	2,511	5,424	8,217	498,010
Nine Months.....1935	663	889	134,629	5,006	45,390	1,562	145,531	8,408	39,933	1,101	3,865	123	596	1,655	2,684	5,016	397,051
% Change 8 Months.....	+ 43	+ 46	+ 27	+ 26	+ 50	+ 41	+ 2	+ 151	+ 37	+ 163	- 18	+ 40	+ 61	+ 52	+ 102	+ 64	+ 25

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MODERN to the minute . . . Sturdier than ever . . . Built to "take it" . . . Greater GMC trailer values than ever before. That, in brief, tells the story. • • • Available complete with standard bodies, the resulting combination is a GMC trailer unit of balanced construction—one that is truck-built to matched specifications by the world's largest builders of commercial vehicles exclusively. • • • Business men in ever-increasing numbers are proving on the job the advantages of GMC trailer ownership. And your nearest General Motors dealer will gladly bring you facts for your careful consideration.

With Quality Features such as these

- ♦ Increased frame strength
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- ♦ Advanced crank construction
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- ♦ Timken over-sized roller wheel bearings
- ♦ Heavy two-stage springs
- ♦ Drop-forged shackles
- ♦ Rubber-bushed radius rods
- ♦ Spoksteel demountable wheels
- ♦ Rubber-cushioned rocking type lower fifth wheel

THE TRAILER OF VALUE

GENERAL MOTORS TRUCK & COACH

DIVISION OF

YELLOW TRUCK & COACH MANUFACTURING COMPANY, PONTIAC, MICHIGAN

SEMI-TRAILER MAKE AND MODEL		FIFTH WHEEL (to match standard upper half)										AXLE									
												FIFTH WHEEL (to match standard upper half)									
CHASSIS	TIRE SIZE	FRAME					SPRINGS					BRAKES									
		Length	Width	Height (in.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)	Front Axle Weight (lb.)								
TWO-WHEEL																					
AVAILABLE		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
F-10		16000	2650	8.25/20D	34x7D	16	Opt	37	77 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6C	42x3	8	S	5	LHV	16x21 ¹ / ₂				
F-12		20000	3160	9.00/20D	36x6D	18	Opt	38 ¹ / ₂	88 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6C	42x3	8	S	5	LHV	16x31 ¹ / ₂				
F-16		24000	3650	9.75/20D	9.75/20D	20	Opt	41 ¹ / ₂	94 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	7C	42x3	10	S	5	LHV	17x44				
B. & J. Super		16000	2100	6.00/20D	34x7D	16	20	40	82 ¹ / ₂ x 14 ¹ / _{2 C}	N	6C	42x3	10	+	+	N	Y	BHV	16x21 ¹ / ₂		
CORBITT		1005	20000	7.50/20D	32x6D	16	20	42	10x21 ¹ / ₂ x 10 ¹ / ₂ C	N	6C	42x3	11	+	+	N	Y	BHV	17x44		
T-10		16000	2756	6.50/20D	32x6D	16	20	38	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	5C	54x3	20	S	Y	N	N	TMV	16x31 ¹ / ₂		
T-12		16000	2756	7.50/20D	9.75/20D	18	20	38	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	5C	54x3	20	S	Y	N	N	TMV	17x44		
T-14		16000	28000	8.25/20D	9.75/20D	20	26	43 ¹ / ₂	10x21 ¹ / ₂ x 10 ¹ / _{2 C}	N	6C	42x3	12	+	+	N	Y	BHV	17x44		
T-16		16000	28000	9.00/20D	9.75/22D	22	24	40 ¹ / ₂	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	6C	42x3	24	S	Y	N	N	TMV	17x45		
T-18		1360	36000	9.30/20D	10.50/20D	24	27	40 ¹ / ₂	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	7C	48x4	21	S	Y	N	N	TMV	17x45		
DORSEY		560	20000	1750	32x6D	16	24	43	10x21 ¹ / _{2 x 10¹/_{2 C}}	N	5C	45x3	12	B	N	5	O	BMV	16x21 ¹ / ₂		
D-8		620	20000	1700	32x6D	16	24	34	10x21 ¹ / _{2 x 10¹/_{2 C}}	N	5C	45x3	14	Y	5C	45x3	12	AI	AI	10000	
E-8		620	20000	1700	32x6D	16	24	34	10x21 ¹ / ₂ x 10 ¹ / _{2 C}	N	5C	45x3	14	Y	5C	45x3	12	AI	AI	10000	
EDWARDS		610	14000	2000	6.50/20D	32x6D	14	Opt	40x2 ¹ / ₂ C	N	8B	42x3	11	B	Y	5	Y	BMV	16x21 ¹ / ₂		
A-2		735	21500	2600	7.50/20D	9.00/20D	16	Opt	40x2 ¹ / ₂ C	N	8B	42x3	13	B	Y	5	Y	BMV	16x21 ¹ / ₂		
A-3		950	24000	2800	8.25/20D	9.75/22D	18	Opt	40x2 ¹ / ₂ C	N	8B	42x3	15	B	Y	5	Y	BMV	16x21 ¹ / ₂		
A-4		1070	28000	3000	9.00/20D	9.75/22D	18	Opt	40x2 ¹ / ₂ C	N	8B	42x3	15	B	Y	5	Y	BMV	16x21 ¹ / ₂		
A-5		1280	36000	3000	9.30/20D	9.75/22D	18	Opt	40x2 ¹ / ₂ C	N	8B	42x3	15	B	Y	5	Y	BMV	16x21 ¹ / ₂		
FITZ GIBBON & CRISP		638	18000	2165	7.00/20D	8.25/20D	16	24	37	8 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	5C	42x3	10	B	Y	7	N	BMV	16x21 ¹ / ₂	
UNIVERSAL-10		812	21500	2800	8.25/20D	9.75/20D	16	26	39	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	6C	42x3	12	B	Y	7	N	BMV	17x44	
212		1051	23000	3075	9.00/20D	9.75/24D	18	26	40	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	6C	42x3	14	B	Y	7	N	BMV	17x44	
216		1200	28000	3095	9.75/20D	9.75/24D	18	26	40	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	6C	42x3	14	B	Y	7	N	BMV	17x44	
316		718	18000	2205	7.00/20D	8.25/20D	16	24	33	10 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	5C	42x3	10	B	Y	7	N	BMV	16x21 ¹ / ₂	
110DF		1280	28000	3080	7.25/20D	9.75/24D	18	26	36	10 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	7C	48x3	14	B	Y	7	N	BMV	17x44	
316DF		1280	23750	3250	7.00/20D	9.75/24D	18	26	36	10 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	7C	48x3	14	B	Y	7	N	BMV	17x44	
GENERAL MOTORS		505	14300	2165	30x5D	34x7D	16	20	36 ¹ / ₂	8 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	6C	45x2 ¹ / ₂	11	B	Y	11	O	BMV	17x44	
TT-218		830	22500	2760	34x7D	34x7D	18	22	42 ¹ / ₂	11 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	6C	45x2 ¹ / ₂	16	B	Y	11	O	BMV	17x44	
TT-219H		1010	28500	3250	34x7D	34x7D	18	22	42 ¹ / ₂	11 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	6C	45x2 ¹ / ₂	16	B	Y	11	O	BMV	17x44	
TT-252		1045	23720	3280	34x7D	34x7D	20	22	42 ¹ / ₂	11 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	7C	48x3	17	B	Y	12	N	BMV	17x44	
GRAMM		465	14350	2165	6.00/20D	9.00/20D	14	24	36 ¹ / ₂	9 ¹ / _{2 x 21¹/_{2 x 10¹/_{2 C}}}	N	5C	48x3	12	B	Y	8	N	BMV	16x21 ¹ / ₂	
DF-35		555	14510	2160	6.00/20D	9.00/20D	14	24	36 ¹ / ₂	9 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	5C	48x3	14	B	Y	8	N	BMV	17x44	
DF-36		825	17200	2850	34x7D	9.75/20D	20	24	38 ¹ / ₂	9 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	5C	48x3	14	B	Y	8	N	BMV	17x44	
DF-70		910	17170	2830	34x7D	9.75/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	5C	48x4	12	S	Y	6	N	BMV	17x44	
DF-80		910	21000	3000	34x7D	10.50/20D	20	24	39 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	5C	48x4	13	B	Y	6	N	BMV	17x44	
DF-81		985	20860	3040	34x7D	10.50/20D	20	24	39 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	5C	48x4	13	B	Y	6	N	BMV	17x44	
DF-90		980	23750	3250	34x7D	11.25/20D	20	24	39 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	7C	48x3	14	N	Y	6	S	BMV	17x44	
DF-91		1045	23720	3280	34x7D	11.25/20D	20	24	39 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	7C	48x3	14	N	Y	6	S	BMV	17x44	
HIGHWAY		510	16000	2160	6.00/20D	7.50/20D	16	24	40 ¹ / ₂	9 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	4CJ	48x3	6	N	Y	5	S	BMV	17x44	
77-B		670	20000	2400	8.25/20D	8.25/20D	16	24	42	9 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	4CJ	48x3	5	S	Y	5	S	BMV	17x44	
77-C		925	24000	3250	8.25/20D	9.75/20D	18	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / _{2 C}	N	4CJ	48x4	12	S	Y	6	N	BMV	17x44	
77-D		1145	24000	3800	9.75/20D	10.50/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	4CJ	48x4	12	S	Y	6	N	BMV	17x44	
77-E		735	16000	2750	8.25/20D	9.75/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	4CJ	48x4	12	S	Y	6	N	BMV	17x44	
87-B		880	20000	3100	8.00/20D	8.50/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6CJ	48x3	5	N	Y	5	S	BMV	17x44	
87-C		1125	24000	3910	8.25/20D	9.75/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6CJ	48x3	5	N	Y	5	S	BMV	17x44	
87-D		1370	24000	4600	9.00/20D	10.50/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6CJ	48x3	5	N	Y	5	S	BMV	17x44	
87-E		1125	24000	3910	8.25/20D	9.75/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6CJ	48x3	5	N	Y	5	S	BMV	17x44	
87-F		1370	24000	4600	9.00/20D	10.50/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6CJ	48x3	5	N	Y	5	S	BMV	17x44	
87-G		1125	24000	3910	8.25/20D	9.75/20D	20	24	47 ¹ / ₂	10 ¹ / ₂ x 21 ¹ / ₂ x 10 ¹ / ₂ C	N	6CJ	48x3	5	N	Y	5	S	BMV	17x44	
87-H		1370	24000	46																	

HIGHWAY—Continued									
107-A.....									
107-B.....	21	56	HM	19	Mar-D	24	60		
107-C.....	21	56	HM	19	Mar-D	24	60		
107-D.....	21	56	HM	21	Mar-D	30	90		
107-E.....	31	56	HM	21	Mar-D	30	90		
107-F.....	31	56	HM	21	Mar-D	30	90		
107-G.....	31	56	HM	21	Mar-D	30	90		
107-H.....	31	56	HM	21	Mar-D	30	90		
107-I.....	31	56	HM	21	Mar-D	30	90		
107-J.....	31	56	HM	21	Mar-D	30	90		
107-K.....	31	56	HM	21	Mar-D	30	90		
107-L.....	31	56	HM	21	Mar-D	30	90		
107-M.....	31	56	HM	21	Mar-D	30	90		
107-N.....	31	56	HM	21	Mar-D	30	90		
107-O.....	31	56	HM	21	Mar-D	30	90		
107-P.....	31	56	HM	21	Mar-D	30	90		
107-Q.....	31	56	HM	21	Mar-D	30	90		
107-R.....	31	56	HM	21	Mar-D	30	90		
107-S.....	31	56	HM	21	Mar-D	30	90		
107-T.....	31	56	HM	21	Mar-D	30	90		
107-U.....	31	56	HM	21	Mar-D	30	90		
107-V.....	31	56	HM	21	Mar-D	30	90		
107-W.....	31	56	HM	21	Mar-D	30	90		
107-X.....	31	56	HM	21	Mar-D	30	90		
107-Y.....	31	56	HM	21	Mar-D	30	90		
107-Z.....	31	56	HM	21	Mar-D	30	90		
KINGHAM.....	16	56	HM	18	Own	30	60		
H-30.....	16	56	HM	18	Own	30	60		
H-40.....	16	56	HM	18	Own	30	60		
LAPEER.....	16	56	HM	18	Own	30	60		
L-22.....	16	56	HM	18	Own	30	60		
MACK.....	16	56	HM	18	Own	30	60		
2-S.....	16	56	HM	18	Own	30	60		
2-5DD.....	16	56	HM	18	Own	30	60		
5-S.....	16	56	HM	18	Own	30	60		
5-5DD.....	16	56	HM	18	Own	30	60		
8-12S.....	16	56	HM	18	Own	30	60		
8-12SDD.....	16	56	HM	18	Own	30	60		
MORELAND.....	16	56	HM	18	Own	30	60		
110.....	16	56	HM	18	Own	30	60		
112.....	16	56	HM	18	Own	30	60		
116.....	16	56	HM	18	Own	30	60		
REO.....	16	56	HM	18	Own	30	60		
16T.....	16	56	HM	18	Own	30	60		
REO MARTIN.....	16	56	HM	18	Own	30	60		
REO SPENCER.....	16	56	HM	18	Own	30	60		
TRAILMOBILE.....	16	56	HM	18	Own	30	60		

SEMI-TRAILER MAKE AND MODEL		CHASSIS		TIRE SIZE		FRAME		SPRINGS		BRAKES		AXLE		FIFTH WHEEL (to match standard upper half)		Width	Price (lower half)																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35				
TWO-WHEEL—Cont.																																						
TRAILMOBILE—Continued	1410	1	1	34x8D	11.25/24D	18	26	46	10x21 $\frac{1}{2}$ C	18	22	46	9x21 $\frac{1}{2}$ C	18	24	47	10x21 $\frac{1}{2}$ C	18	36	48	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	1	1	1	1	1	1	1	1	1	1	
T-322	950	1	1	6.00/20D	8.25/20D	18	24	47	10x21 $\frac{1}{2}$ C	18	24	47	10x21 $\frac{1}{2}$ C	18	36	48	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	1	1	1	1	1	1	1	1	1	1					
T-322	1495	1	1	32x6-10D	38x7D	18	24	47	10x21 $\frac{1}{2}$ C	18	24	47	10x21 $\frac{1}{2}$ C	18	36	48	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	1	1	1	1	1	1	1	1	1	1					
T-422	1885	1	1	34x7D	6.75/20D	18	24	47	10x21 $\frac{1}{2}$ C	18	24	47	10x21 $\frac{1}{2}$ C	18	36	48	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	1	1	1	1	1	1	1	1	1	1					
TRUCK ENGINEERING	575	16000	2200	7.00/20D	8.25/20D	16	22	38	8x21 $\frac{1}{2}$ C	16	24	40	10x21 $\frac{1}{2}$ C	16	26	42	10x21 $\frac{1}{2}$ C	16	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
2SF	735	20000	2800	7.50/20D	9.00/20D	18	26	42	10x21 $\frac{1}{2}$ C	18	26	42	10x21 $\frac{1}{2}$ C	18	28	43	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
3SF	1030	25000	3500	9.00/20D	9.75/20D	18	26	42	10x21 $\frac{1}{2}$ C	18	26	42	10x21 $\frac{1}{2}$ C	18	28	43	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
4SF	1295	23000	4000	9.75/20D	11.25/20D	18	26	42	10x21 $\frac{1}{2}$ C	18	26	42	10x21 $\frac{1}{2}$ C	18	28	43	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
BSF	1295	24000	4000	9.75/20D	11.25/20D	18	26	42	10x21 $\frac{1}{2}$ C	18	26	42	10x21 $\frac{1}{2}$ C	18	28	43	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
UTILITY	635	12000	20000	2800	8.25/20D	20	20	38	8x4	16	18	36	8x4	16	20	22	43	10x4	16	30x4	20	B	Y	5	0	0	0	0	0	0	0	0	0	0				
SW2	788	16000	23000	2800	8.25/20D	20	20	38	8x4	16	18	36	8x4	16	20	22	43	10x4	16	30x4	20	B	Y	5	0	0	0	0	0	0	0	0	0	0				
SW3	1015	20000	32000	2800	9.00/20D	20	20	38	8x4	16	18	36	8x4	16	20	22	43	10x4	16	30x4	20	B	Y	5	0	0	0	0	0	0	0	0	0	0				
SW4	1154	24000	40000	2800	9.00/20D	20	20	38	8x4	16	18	36	8x4	16	20	22	43	10x4	16	30x4	20	B	Y	5	0	0	0	0	0	0	0	0	0	0				
FOUR-WHEEL																																						
GENERAL MOTORS	1190	25000	3900	32x6D	34x7D	20	24	37 $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$ C	6	N	7C	40x2 $\frac{1}{2}$ *	13	B	Y	5	Y	BMV	17 $\frac{1}{2}$ x $\frac{1}{2}$ C	N	41B	O	Tim	20000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	18	Own-D	33	90					
KINGHAM	955	24000	3200	32x6D	34x7D	18	30	50	10x21 $\frac{1}{2}$ C	18	30	50	10x21 $\frac{1}{2}$ C	18	30	50	10x21 $\frac{1}{2}$ C	18	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
ETT30	1310	30000	3600	38x6D	38x7D	20	30	53	10x21 $\frac{1}{2}$ C	20	30	53	10x21 $\frac{1}{2}$ C	20	30	53	10x21 $\frac{1}{2}$ C	20	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
ETT40	1870	38000	4000	38x6D	38x7D	20	30	53	10x21 $\frac{1}{2}$ C	20	30	53	10x21 $\frac{1}{2}$ C	20	30	53	10x21 $\frac{1}{2}$ C	20	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
ETT50	1870	38000	4000	38x6D	38x7D	20	30	53	10x21 $\frac{1}{2}$ C	20	30	53	10x21 $\frac{1}{2}$ C	20	30	53	10x21 $\frac{1}{2}$ C	20	50x5	20	B	Y	5	0	0	0	0	0	0	0	0	0	0					
MORELAND	1250	28000	4520	7.50/20D	8.25/20D	20	30	50	8x3 $\frac{1}{2}$ C	16	30	50	8x3 $\frac{1}{2}$ C	16	30	50	8x3 $\frac{1}{2}$ C	16	30x3 $\frac{1}{2}$ *	20	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	20000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90	
210	1450	36000	4750	8.25/20D	9.00/20D	22	30	50	8x3 $\frac{1}{2}$ C	22	30	50	8x3 $\frac{1}{2}$ C	22	30	50	8x3 $\frac{1}{2}$ C	22	30x3 $\frac{1}{2}$ *	20	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	24000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90	
212	1450	36000	44000	6200	6200	24	30	50	8x3 $\frac{1}{2}$ C	24	30	50	8x3 $\frac{1}{2}$ C	24	30	50	8x3 $\frac{1}{2}$ C	24	30x3 $\frac{1}{2}$ *	20	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	504	Y	Tim	32000	5x $\frac{1}{2}$ *	Tu	3 $\frac{1}{2}$ *	65	HM	36	90	
216	1626	38000	44000	6200	6200	24	30	50	8x3 $\frac{1}{2}$ C	24	30	50	8x3 $\frac{1}{2}$ C	24	30	50	8x3 $\frac{1}{2}$ C	24	30x3 $\frac{1}{2}$ *	20	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	504	Y	Tim	32000	5x $\frac{1}{2}$ *	Tu	3 $\frac{1}{2}$ *	65	HM	36	90	
TRAILMOBILE	705	1050	1200	7.50/20D	8.25/20D	12	18	36	8x2 $\frac{1}{2}$ C	12	18	36	8x2 $\frac{1}{2}$ C	12	18	36	8x2 $\frac{1}{2}$ C	12	18x2 $\frac{1}{2}$ *	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	20000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90	
F-32	1050	1200	7.50/20D	8.25/20D	14	18	36	8x2 $\frac{1}{2}$ C	14	18	36	8x2 $\frac{1}{2}$ C	14	18	36	8x2 $\frac{1}{2}$ C	14	18x2 $\frac{1}{2}$ *	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	24000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90		
F-32	1250	1200	7.50/20D	8.25/20D	14	18	36	8x2 $\frac{1}{2}$ C	14	18	36	8x2 $\frac{1}{2}$ C	14	18	36	8x2 $\frac{1}{2}$ C	14	18x2 $\frac{1}{2}$ *	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	24000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90		
UTILITY	950	20000	3300	36x6D	32x6D	18	20	35	8x4	1	20	35	8x4	1	20	35	8x4	1	20x4	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	20000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90	
SW28	1252	24000	3800	5000	8.25/20D	9.00/20D	22	24	38	8x4	1	20	35	8x4	1	20	35	8x4	1	20x4	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	24000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90
SW29	1670	30000	5000	8.25/20D	9.00/20D	22	24	38	8x4	1	20	35	8x4	1	20	35	8x4	1	20x4	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	24000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65	HM	24	90	
SWX10	1943	40000	5500	8.25/20D	9.00/20D	22	24	38	8x4	1	20	35	8x4	1	20	35	8x4	1	20x4	10	R	N	Y	LHV	16x3 $\frac{1}{2}$ *	CI	420	Y	Tim	24000	4x $\frac{1}{2}$ *	Tu	2 $\frac{1}{2}$ *	65</td				

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WAYS TO REDUCE OPERATING COSTS



Faulty spark plugs are JUST ONE OF SIXTEEN engine defects that can steal your gasoline!

EVERY gasoline operator knows there's a lot to do in addition to picking the right gasoline! While there are sixteen possible engine defects which can throw it away!

EVERY operator of a motorized fleet knows there's a lot to do in addition to picking the right motor fuel must have, whose training and sole duty is to lower the operating cost of Standard Serviced fleets. Their services

check up thorough and easy. Ask your local Standard Oil (Indiana) office to give you the details.

STANDARD OIL COMPANY (INDIANA)

910 SOUTH MICHIGAN AVENUE • CHICAGO, ILL.

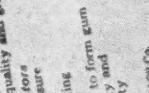
STANDARD OIL PRODUCTS: ISO-VIS "D" • Standard Transmission Oil (Summer and Winter Grades) • Standard Heavy Duty Gear Grease • Standard Wheel Bearing Grease (Medium and Heavy) • Standard Pressure Gun Grease (Medium and Heavy) • Standard Water Pump Grease.

Cop. 1936, Standard Oil Co.

STANDARD OIL COMPANY (INDIANA)

STANDARD OIL PRODUCTS: ISO-VIS "D" • Standard Transmission Oil (Summer and Winter Grades) • Standard Heavy Duty Gear Grease • Standard Wheel Bearing Grease (Medium and Heavy) • Standard Pressure Gun Grease (Medium and Heavy) • Standard Water Pump Grease.

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COMMERCIAL CAR JOURNAL

THIRD-AXLE SPECIFICATIONS

All Material Copyright 1936 by Chilton Co. [Inc.]

THIRD AXLE MAKE AND MODEL and Truck Model adapted to	Capacity (Lb.) See Explanatory Notes	Price (f. o. b. factory)	Weight (Lb.) with Max. Tires, Frame Extension, Etc.	Maximum Tire Size	LOAD DIS- TRIBUTION RANGE (First figure of combination applies to center axle; second figure to third axle)	Axle Spacing (with maximum tires)	AXLE DATA		BRAKES (Standard)		Lining Area	Number of Points of Frame Support	Spring Size or Number Leaves Added	Spindle Diameter (at inner bearing)			
							Make	Type	Size	Make and Type							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Trailing Axles																	
ACME																	
50 (Ford 1½)	10000	320	1460	32x6-10	50-50		42	Own	T	3½	BM	CA	16x2½	181	2	4 or 6	2½
60-H (Chevrolet 1½)	10000	350	1560	32x6-10	50-50		42	Own	T	3½	CH	PS	16x3	217	2	7 or 9	2½
GUILDER																	
C (All Makes)	8000	499	1420	32x6-10	50-50	65-35*	46	Tim	T	3½	LHV	CA	16x2½	135	6	39x2½	2½
E (All Makes)	8000	544	1710	7.50 20	50-50	65-35*	46	Tim	T	3½	LHV	CA	16x2½	135	6	39x2½	2½
F (All Makes)	10000	645	1810	34x7	50-50	65-35*	46	Tim	T	4	LHV	CA	16x2½	135	6	39x2½	2½
H (All Makes)	10000	695	2369	8.25 20	50-50	65-35*	48	Tim	T	4	LHV	CA	16x3½	206	6	40x3	2½
J (All Makes)	12000	803	2464	9.00 20	50-50	65-35*	48	Tim	T	4½	LHV	CA	16x3½	206	6	40x3	2½
K (All Makes)	12000	928	2660	9.75 20	50-50	65-35*	48	Tim	T	4½	LHV	CA	17½x4	296	6	40x3	2½
K-L (All Makes)	12000	1078	2850	9.75 20	55-45	65-35*	49	Tim	T	4½	LHV	CA	17½x4	296	6	42x3½	2½
L (All Makes)	14000	1177	3075	10.50 24	55-45	65-35*	52	Tim	T	5	LHV	CA	17½x4	296	6	42x3½	2½
M (All Makes)	16000	1294	3200	10.50 24	55-45	65-35*	52	Tim	T	5	LHV	CA	17½x5	370	6	42x3½	3
HI-LO																	
F-36 (Ford 1½)	10000	350	1625	32x6-10	60-40		44½	Lig	Sq	2½	BMV	CA	16x2½	167	2	6	2½
C-36 (Chevrolet 1½)	10000	385	1700	32x6-10	60-40		44½	Lig	Sq	2½	LHV	CA	16x2½	150	2	9	2½
LE MOON																	
TU (Ford 1½)	10000	350	900	32x6-10	50-50		40	Tim	T	3½	BM	CA	16x2½	158	1	1 plate	2½
LITTLE GIANT																	
6-ton (For any 1½ ton truck)	12000	308	1200	32x6	50-50	60-40	42	Own	Sr	2½	LHV	CA	16x2½	225	6	22x2½	2
8-ton (For any 1½ ton truck)	16000	451	1575	32x6	50-50		42	Shu	Sq	2½	LHV	CA	16x2½	210	4	42x2½	3
8-ton (For any 2 ton truck)	16000	575	2000	6.50 20	50-50		42	Shu	Sq	2½	LHV	CA	16x3	180	4	42x3	3
10-ton (For any 2½ to 5 ton truck)	20000	695	2410	9.75 20	50-50		44	Shu	Sq	4	LHV	CA	17x3	180	4	44x3½	3
PERFECTION																	
HDF (Ford)	10000	380	1804	32x6-10	50-50		42	Own	Sr	2½	BM	CI	16x2½	167	2	42x3	2
HDC (Chevrolet)	10000	440	1824	32x6-10	50-50		42	Own	Sr	2½	BMV	CI	16x2½	167	2	42x3	2
TIMKEN																	
SBT-800-H (Federal 15, 18, 20; GMC T-16, T-18; Brockway 78, 87, 90X, 96; Indiana 86; Diamond T 212-A; Dodge LF-35; Studebaker Ace)	8000	***	1910	7.50 20	55-45		44	Tim	T	3½	LHV	CA	16x3½	132	1	48x2½	2½
ST-730-BY (Ford 1½)	8000	***	1674	32x6-10	55-45		44	Tim	T	3½	BMV	CA	16x2½	158	1	48x2½	2½
ST-740-H (Chevrolet 1½)	8000	***	1681	32x6-10	55-45		44	Tim	T	3½	LHV	CA	16x2½	132	1	48x2½	2½
TRUCKTOR																	
HLF (Ford 1½)	8800	432	1331	32x6-10	50-50	60-40	40	Own	Sr	3	BMV	CA	16x2½	179	6	38½x2½	2½
HLC (Chevrolet 1½)	8800	432	1302	32x6-10	50-50	60-40	41	Own	Sr	3	CHV	CA	16x3	219	6	38½x2½	2½
HLD (Dodge 1½)	8800	432	1317	32x6-10	50-50	60-40	41	Own	Sr	3	LHV	CA	16x2½	132	6	38½x2½	2½
HLL (Light trucks tires to 34x7 inclusive)	11000	557	1538	34x7	50-50	60-40	45	Own	Sr	3	LHV	CA	16x2½	132	6	38½x2½	2½
HLR (Medium trucks tires to 9.75/20 inclusive)	16000	998	2297	9.75-20	50-50	60-40	48	Own	Sr	3½	LHV	CA	16x3½	205	6	40x3	2½
HR (Heavy trucks tires above sizes listed)	21000	1218	2599	10.50 24	50-50	60-40	52	Own	Sr	4	LHV	CA	17½x4	251	6	41½x3	3½
TRUXMORE																	
17 (Ford)	8800	415	1691	32x6-10	55-45	65-35*	42	Own	Sq	2½	BMV	CA	16x2½	180	4	**	2½
17 (Chevrolet)	8800	415	1691	32x6-10	55-45	65-35*	42	Own	Sq	2½	LHV	CA	16x2½	148	4	**	2½
20 (All makes)	8800	450	1784	32x6-10	55-45	65-35*	42	Own	Sq	2½	LHV	CA	16x2½	148	4	**	2½
25 (All makes)	11200	680	2206	34x7	52-48	65-35*	46	Own	Sq	2½	LHV	CA	16x3½	206	4	**	2½
30 (All makes)	13000	925	2509	9.00 20	50-50	65-35*	46	Own	Sq	3	LHV	CA	17½x4	252	4	**	2½
40 (All makes)	20800	1065	3336	10.50 24	50-50	65-35*	51	Own	Sq	3½	LHV	CA	17½x5	350	4	**	3½
UTILITY																	
15 (For any 1½ ton truck)	7500	303	900	7.00 20	55-45	66-33	40	Own	Sq	2½	BM	CA	15x2½	152	4	None	2½
25 (For any 2 ton truck)	9000	389	1100	7.50 20	55-45	66-33	41	Own	Sq	2½	OMV	CA	15x3½	210	4	None	2½
30 (For any 3½ ton truck)	13000	594	1600	9.00 20	55-45	66-33	44	Own	Sq	3	OMV	CA	17x4	264	4	None	2½
35 (For any 5 ton truck)	18000	700	1900	10.50 24	55-45	66-33	50	Own	Sq	3½	OMV	CA	17x4	264	4	None	2½
Driving Axles																	
GRICO																	
(Ford 1½)	10000	738	6200	34x7-10	50-50		42½	Ford	T	3½	BM	CA	14x4½	175	3	42½x2½	2½
(Chevrolet 1½)	10000	702	6100	34x7-10	50-50		42½	Ford	T	3½	LH	CA	16x3	214	4	42½x2½	2½
THORNTON TANDEM																	
AF (Ford 1½)	10000	735	6400	34x7-10	50-50		42	Ford	T	3½	BM	CA	14x4½	174	3	42x2½	2½
AC (Chevrolet 1½)	10000	735	6350	34x7-10	50-50		42	Ford	T	3½	LH	CA	16x3½	215	3	42x2½	2½

ABBREVIATIONS:

General
***—Timken—Prices under revision
**—Load distribution may be shifted readily even when truck is loaded, on the road.
**—Truxmore—Heavy steel beams (cushioned by patented spring arrangement) used in place of leaf springs.
†—Little Giant - or BM

Notes:

General—(a) The capacity of the third axle (Column 2) is not to be confused with the total capacity made possible on the converted vehicle.

Column 3. The price of the unit includes the

**COLUMN 9
(Axle Make)**

Chev—Chevrolet
Ford—Ford
Lig—Liggett
Own—Own
Shu—Shuler
Tim—Timken

**COLUMN 10
(Type of Axle)**

Sq—Square
Sr—Solid round
T—Tubular

**COLUMN 12
(Brakes, Make and Type)**

BM—Bendix mechanical

B—Bendix

C—Chevrolet

L—Lockheed

O—Own

H—Hydraulic

M—Mechanical

V—Vacuum power

**COLUMN 13
(Brake Drum Material)**

CA—Cast Alloy Iron

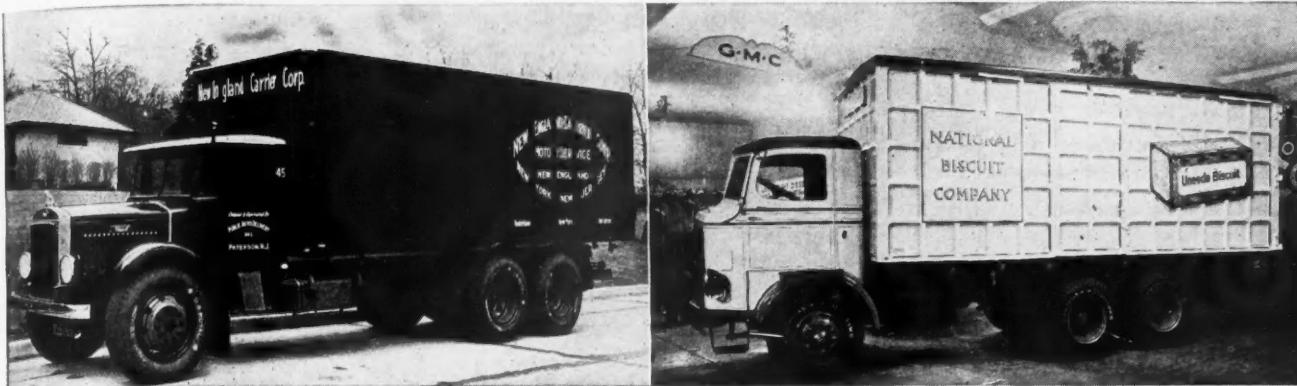
CI—Cast iron

PS—Pressed steel

Column 12 deals with standard brakes. As a general rule, a variety of options is available with corresponding changes in price.

Column 15 gives brake lining area of attachment unit only.

DOUBLED LOADS THAT BAD WEATHER CANNOT STOP TRUCKTOR MAKES WINTER HAULING MORE PROFITABLE



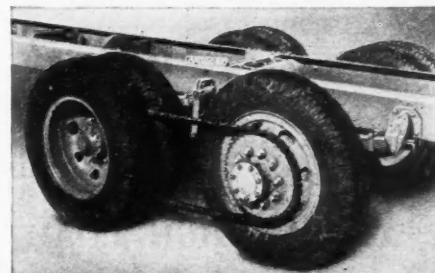
Loading Light for Bad Weather Causes You Needless Loss!

TRUCKTOR installations are now being made thick and fast—for winter is here—and winter ordinarily means profitable loads sacrificed or cut in size, delayed deliveries, getting stuck on the road, or perhaps actual breakdowns—headaches galore for fleet operators that TRUCKTOR can cure.

There are these two sides to trucking—first—ability to load to capacity—second—ability to get the load over the road and delivered on time at a PROFIT instead of a loss.

Trucktor DOUBLES the load capacity and creates a safe, synchronized 6-wheel vehicle that generally makes good progress in bad going. When travel is extra bad and more traction is required, Trucktor's Detachable Chain and Sprocket 4-Wheel Drive (attached or detached in a few minutes), provides the temporary boost that keeps the wheels rolling—with a minimum of costly wear and tear on power plant and running gear. With this attachment a heavily loaded truck will plough through where a fifth wheel semi-trailer, or even a four-wheel truck will be stopped.

Trucktor is now cutting hauling costs and aiding winter deliveries for many of the largest distributors of food products, gasoline, fuel oil, fast freight, and other commodities that MUST GET THROUGH REGARDLESS OF WEATHER AND ROAD CONDITIONS. Moreover, the size of loads handled has created a new low cost for hauling.



When You Need More Traction Here It Is!

It's The TRUCKTOR DETACHABLE CHAIN
AND SPROCKET 4-WHEEL DRIVE

Photo shows how sprockets of Trucktor Detachable 4-Wheel Drive are mounted between discs and how the chain runs between the dual tires. Chain is put on or detached in a few minutes without removal of tires.

Get the facts about TRUCKTOR. It equips Trucks of every size and tonnage—experience data furnished in any field of trucking in which you are interested. Don't wait until Old Man Winter puts a crimp in your operations. Act NOW.



THE TRUCKTOR CORPORATION
156 WILSON AVE. NEWARK, N.J.

News SUMMARY

GMC to Fill-Out Camel-Back Line and Add Standard $\frac{1}{2}$ -Ton at \$395

GMC will soon announce a complete line of cab-over-engine trucks ranging in size from $1\frac{1}{2}$ ton to 12 tons including a $1\frac{1}{2}$ -ton chassis at \$525, according to J. P. Little, vice-president and director of sales.

In addition, a 112-in. wheelbase standard $\frac{1}{2}$ -ton model will supplement the 126-in. wheelbase unit now offered. Price will be \$395 for the chassis f.o.b. Pontiac, Mich. This is the lowest price ever placed on a GMC truck. Both models will be available with pick-up or panel bodies of larger than average size. The longer wheelbase unit will accommodate a body 8 ft. 5 in. long or a pick-up body 7 ft. 7 in. long.

Insurance Filing Deadline Dec. 15

The deadline for filing such policies as surety bonds, policies of insurance, qualifications of the self-insurer, etc., has been set for Dec. 15 by the Interstate Commerce Commission.

10 Months' Sales Up 24%; Output Ahead 12%

October Sales Show 12 Per Cent Gain; Output 42 Per Cent Low

New truck registrations for October, 1936, are estimated at 42,000 units, based on returns from 39 states. This represents a gain of 12 per cent over October, 1935, when 37,439 units were sold. October sales dropped below September by 12,600. Sales for the first 10 months of 1936 totaled 540,000, with October estimated. This is a gain of 24 per cent over sales for the same period last year with 434,490 sales.

Production for October, 1936, dropped below production for October, 1935, by 42 per cent. Actual figures are 34,709 units against 60,203. October is also below September of this year by 26 per cent with a difference of 12,000 units. Production for the first 10 months of 1936 totaled 678,755 units, which is 12 per cent above production for the same period last year when 606,650 units were produced.

"STURACO"
EXTREME PRESSURE ("E.P.")
GEAR AND CHASSIS LUBRICANTS

For Winter Operations BY ALL MEANS INSIST UPON THE USE OF "STURACO"

B
E
C
A
U
S
E
its predetermined and uniform
HIGH LOAD CARRYING CA-
PACITY will prevent costly gear
and bearing failures due to shock
loads resulting from slippage of
wheels on icy roads.

Investigate at once this low cost "Insurance Policy" by writing for Bulletin No. 4.

The BIG THREE

GEAR LUBRICANT

CHASSIS LUBRICANT

WHEEL CHASSIS LUBRICANT

"STURACO" E.P. LUBRICANTS
ARE THE ORIGINAL DEVELOPMENT OF
D.A. STUART & CO.
ESTABLISHED 1865
GENERAL OFFICES, 2727-2753 SO. TROY ST. CHICAGO, U.S.A.
BRANCHES IN PRINCIPAL CITIES



Dave S. Craven (left) has been made general service manager of the Cummins Engine Co., Columbus, Ind., succeeding C. A. Buxton (right) who has been promoted to assistant sales manager for the company.

Keeshin-Rail Arrangement Okay

The Interstate Commerce Commission has approved the arrangement between the Chicago Great Western Railroad and the Keeshin trucking interests for joint motor-rail rates.

Studebaker-Autocar to End Agreement

Termination of the merchandising contract between the Autocar Co., Ardmore, Pa., and the Studebaker Corp., South Bend, is scheduled definitely for the end of the year, according to reliable sources. Neither party to the contract would issue a statement. The agreement between the two companies has been in effect since Feb. 1934.

Newark Truck Show A Success

Well over a million dollars' worth of motor trucks, engines and accessories was exhibited to the public at the 1936 National Motor Truck Show which was held at the Center Market Building in Newark, N. J., last month. Sixty-four exhibitors, almost a 50 per cent increase over the number showing last year, displayed their products at this third annual show conducted by the New Jersey Motor Truck Association cooperating with the S.A.E., the Newark Chamber of Commerce and the New Jersey Highway Users Conference.

(ADDITIONAL NEWS ON PAGE 44)

HERE IS GREATER VALUE

for you

The best buy in tire chains—tests prove it

More than double the mileage you used to get from ordinary tire chains. Greatly increased traction. Shorter stopping distance. Protection against forward and side skids. That's what you get in Weed American Bar-Reinforced Tire Chains. What makes these tire chains so much better? Four basic improvements: — Bar-reinforcements double-welded to cross chains; Weedalloy—a tougher, harder metal, hardened electric welded side chains, and Weed patented lever lock end hooks. Inquire.

AMERICAN CHAIN COMPANY, Inc.
Bridgeport, Connecticut

Boston, New York, Philadelphia, Pittsburgh, Chicago, San Francisco

In Business for Your Safety

SAFETY

WEED **AMERICAN** Bar-Reinforced **TIRE CHAINS**

MORE THAN DOUBLE SAFE MILEAGE

Licensed to manufacture and sell Bar-Reinforced Tire Chains under United States and Canadian Letters Patent: American Chain Company, Inc.; The McKay Company; The Heddell Chain Company; Pyrene Manufacturing Company; Dominion Chain Company, Limited; and Pyrene Manufacturing Company of Canada, Limited.

NEWS

(CONTINUED FROM PAGE 42)

Spiller is White's Chief Engineer

W. R. Spiller has been appointed to the post of chief engineer for the White Motor Co. He succeeds F. G. Alborn, who recently resigned.

Mr. Spiller came to the White company as an apprentice from the University of Pennsylvania, where he received a mechanical engineering degree in 1922. Shortly after his coming he was sent to work in the company laboratory, became assistant research engineer, and was finally named truck engineer, which position he held until his new appointment.



These seven men have been added to the truck division of the Studebaker Corp., following a stiff educational course in product and truck merchandising. They are (left to right): N. K. Campbell, Pittsburgh branch; F. M. Sorley, New York; R. E. Lowe, Philadelphia; L. C. White, South Bend; J. K. Reed, South Bend; W. K. Armstrong, Philadelphia; L. J. Crotteau, N.Y.C.

Goodrich Ups Keeling

N. H. Keeling has been appointed manager of retail sales promotion of the B. F. Goodrich Co.

Sherwin-Williams Appoints Two

Harry C. Adams has been appointed to the position of Automotive Production Technical Adviser and Dan J. Connolly has been appointed Refinishing Technical Adviser by the Sherwin-Williams Co.

BUY "QUALITY" FOR "SAFETY"



PILOT DIRECTION SIGNAL

1. STANDARD LITE
2. TWO-WAY LITE
3. FLUSH MOUNT LITE

BEACON DIRECTION SIGNAL

332 TRUCK FLARE KIT

R. E. DIETZ COMPANY, NEW YORK
PIONEER MAKERS OF VEHICLE LAMPS, FOUNDED 1840

HEAD LIGHTS • TAIL LIGHTS • MARKER LIGHTS • DITCH, FOG & SPOT LIGHTS • DIRECTION SIGNALS
TRUCK FLARES • REAR VISION MIRRORS • FLOOD LIGHTS • CATAPOLE REFLECTORS • FIRE EXTINGUISHERS

William F. McAfee, motor truck sales manager of International Harvester Co., has been appointed Chairman of the Motor Truck Committee of the Automobile Manufacturers Assn.

Autocar Splits New York Territory

George M. Wilkins is the district manager of the new Buffalo, N. Y., branch of the Autocar Co., Ardmore, Pa. Branches have also been established in Rochester and Syracuse, N. Y., with Harold Fox and W. H. Brown as managers respectively.

Shaler Co. Moves

The sales office of the Shaler Co., manufacturers of hot patches, tire and tube vulcanizers, etc., has been moved from 1400 E. Park Place, Milwaukee, to Waupun, Wis.

Contract Filing is Now Feb. 1

Contract motor carriers will not have to file copies of their contracts now until Feb. 1, 1937, according to an order of the I.C.C. This order modifies the Dec. 1 filing date.

ATA Pick-Up Suit Refused

The petition filed by the ATA in an effort to halt rail carriers from handling freight by truck without having been issued certificates has been denied.

Black to AMCO

Sidney J. Black has joined the Asbestos Mfg. Co., Huntington, Ind., and will supervise a staff of field representatives in the Middle West, promoting the sale of AMCO brake lining and clutch facings. Headquarters will be in the Mercantile Exchange Building, Chicago.

Correction Truck Engineering Corp.

In the November issue, on page 29, the name of the Truck Engineering Corp., Cleveland, in caption No. 11, was erroneously given as Truck Engineering Co., Fort Wayne, Ind. Truck Engineering Corp., Cleveland, is correct.

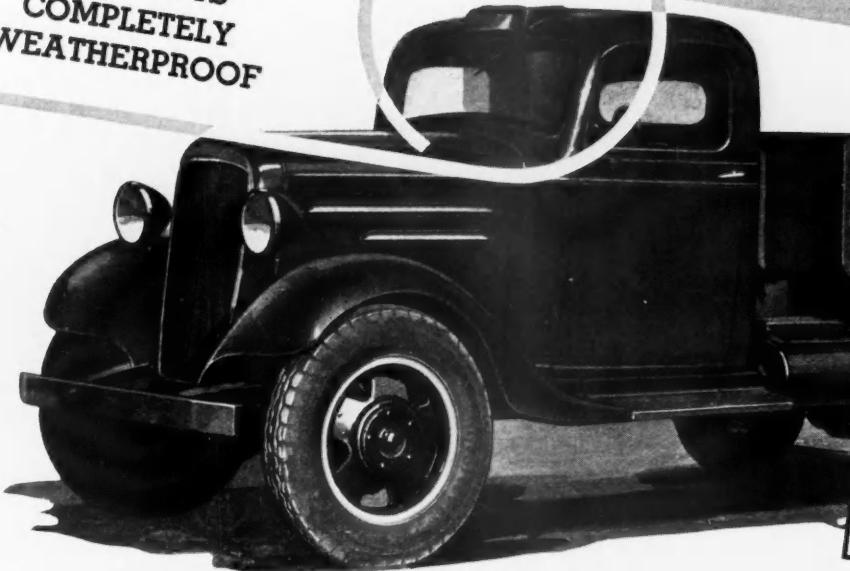
(ADDITIONAL NEWS ON PAGE 60)

COMMERCIAL CAR JOURNAL
DECEMBER, 1936

Positive

NO FUMES
NO GASES
NO DRAFTS
COMPLETELY
WEATHERPROOF

INTAKE AND EXHAUST VENTILATION FOR TRUCK CABS



Fits Any Cab
Easily Installed
On Old Cabs as
well as New
LIST PRICE LIST PRICE
\$9.50 **\$7.50**
With marker lights Without marker lights

Fresh Air at All Times

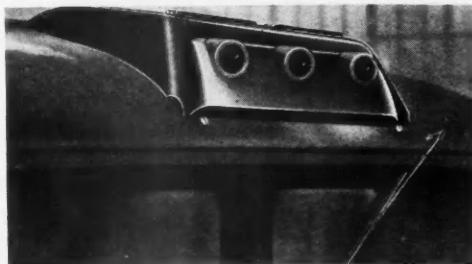
It is common knowledge that many accidents and most inefficiency in truck operation are due to driver discomfort. A sleepy, half-doped driver, who breathes foul air and fumes or courts ill-

ness by opening windows in bad weather, can not be a great asset to any operator. If he drives in comfort and health with Evans universal truck cab ventilation, his efficiency is increased.

PROTECT YOUR DRIVER AND YOU PROTECT YOUR PAY LOAD

The following chart gives results of actual performance tests on changes of air:

CAR SPEED	FRESH AIR
At 5 M.P.H. . . .	1 change per min.
At 20 M.P.H. . . .	2 changes per min.
At 30 M.P.H. . . .	3 changes per min.
At 45 M.P.H. . . .	4 changes per min.



Above photograph shows intake and exhaust louvers in cab roof. Note that intake may be directed toward windshield if desired. Left is enlarged view of universal ventilator installed with marker lights.



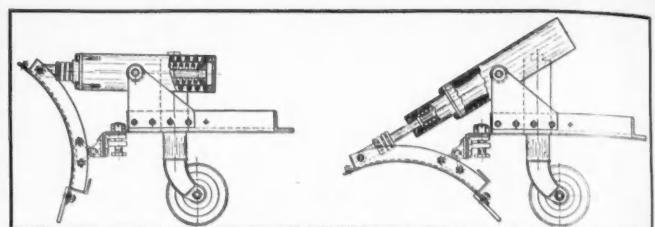
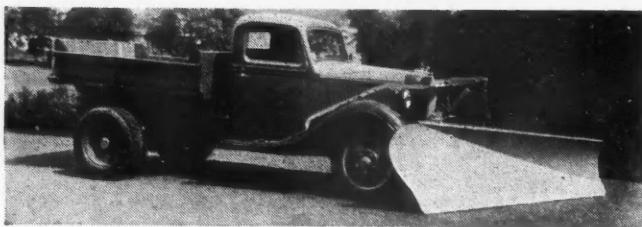
Ventilating Heating Systems

EVANS VENTILATION-HEATING Division of EVANS PRODUCTS CO., Union Guardian Bldg., Detroit

COMMERCIAL CAR JOURNAL
DECEMBER, 1936

Evans Ventilating-Heating
2428 Union Guardian Bldg., Detroit, Michigan
Please send me complete information on Evans universal ventilators on Evans ventilating systems for trucks.

(make) _____
Name _____
Address _____
City _____ State _____



Left—New Model 200 plow. Right—Detailed drawing of safety blade trip

New Safety Blade Trip for Plows

SNOW plow models 120, 130, 220 and 230 made by the Good Roads Machinery Corp., Kennett Square, Pa.,

have a new automatic safety blade trip which increases the former action and efficiency by 100 per cent. Dual com-

pression springs in separate steel cylinders telescope within one another. The hinged pivoting point is centered on outside cylinder and raised well above supporting semi-circle. On striking a surface obstruction the top of the moldboard is automatically tipped forward and downward. The new blade trip makes it possible for the blade to ride over higher obstructions.

The new model 200 plows for $1\frac{1}{2}$ ton trucks represents the latest development in blade plows. Moldboards are the same height, at front end of plow, as those on reversible blade models but taper towards the end.

Fuel Pump Maintenance

(CONTINUED FROM PAGE 15)

The average fuel pump stroke is between $\frac{1}{8}$ in. and $\frac{1}{4}$ in. at the cam-shaft end of the rocker arm. Since the stroke is so short it is imperative that any part of the linkage that shows any appreciable wear must be renewed so that the effective stroke will not be shortened. The cam end of the rocker arm can pass inspection when the wear is .010 in. or less but when wear exceeds that figure replace rocker arm.

Reassembly of the pump consists of replacing the various parts in reverse order. In some cases the diaphragm and pull rod are assembled as a unit and then replaced in the pump body. If there are tabs on the outer edge of the diaphragm they should be lined up with the center line of the flat sides at the bottom of the pull rod. If there are no tabs simply line up two opposite cover screw holes with the center line. When assembling to the pump body the tabs should be in line with the rocker arm. In assembling the diaphragm assembly to the body the pull rod must engage properly with the link at its base and the cover screw holes must line up. When installing cover flex diaphragm to highest position.

A normal pump should prime itself with 40 or less strokes of the rocker arm with the line connected to a can of fuel. With a pressure gage connected to the exhaust the average pump should show 2 to $3\frac{1}{2}$ lb. pressure and if the valves are seating correctly hold this pressure for several minutes. The large size pumps shows as much as 4 lb. pressure. The average pump should draw 8 to 11 in. of vacuum.

How many
STRINGS
to a
TRUCK?

ORDER DEPT.
CREDIT DEPT.
ROUTING DEPT.
REPAIR DEPT.
GARAGE
FREIGHT DEPOT
SHIPPING ROOM
DRIVER

OR

WHY does a
truck stand still?

PEOPLE used to think it was the driver—when they thought at all. Now they figure differently. And they are discovering a lot of interesting things. Among them this:

Most of the idle time of a truck is due to other factors than the driver.

Perhaps they make a little change in the order department, or some trifling change in office routine, and as a result several expensive trucks increase their running time an hour a day! . . . What starts them doing this? . . . When they find out when the delays occur, and for how long, then they can't help

going after the cause. . . . The Servis Recorder automatically shows up all delays on a graphic chart—like pointing a finger at them.

Today more than 100,000 Servis Recorders are looking after more than 100,000 trucks, and those trucks are keeping busy. . . . Have you investigated it yet?

Write for Bulletin! — Ten Ways of Getting More Work Out of Motor Trucks



The Service Recorder Company
1422 Euclid Ave., Cleveland, O.

The Servis Recorder
Tells Every Move Your Truck Makes

1180.3200.11.2400.11.23/24/

MAKE AND MODEL	GENERAL (See Keynote)			TIRE SIZES		ENGINE DETAILS			TRANSMISSION		REAR AXLE		FRONT AXLE		BRAKES		FRAME	
	Front	Rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear	Front and rear
1. Corbit	F12 1/2-2	2375 1/2-2	131 180	4420 6.50/20D	7.50/20	Wau 6BL	6-3	3x3x3	245 5.4	72-3000	7 2/4x10 1/2	N	W/G T9	4 Tim 53615H	SF	H 5.14-6.6	W/G T9	
2.	F14 2-3	3200 1/2-3	165 180	5080 7.50/20D	8.25/20	Wau 6BLK	6-3	3x3x3	225 5.4	190-240	80-240	N	W/G T9	4 Tim 53440H	SF	H 5.8-6.8	W/G T9	
3.	F18 2-3	4500 2-3	165 185	6900 8.25/20D	9.00/20	Wau 6BLK	6-3	3x3x3	240 5.4	190-240	80-240	N	W/G T9	4 Tim 53440H	SF	H 5.8-6.8	W/G T9	
4.	F22 2-3	6500 2-3	190 210	9000 9.00/20D	9.75/20	Wau 6BLK	6-3	3x3x3	311 5.4	100-250	120-250	N	W/G T9	4 Tim 53440H	SF	H 5.8-6.8	W/G T9	
5.	F26 2-3	10000 6-10	190 210	10100 9.75/20D	10.50/22	Wau 6BLK	6-3	3x3x3	442 4.5	100-250	120-250	N	W/G T9	4 Tim 53440H	SF	H 5.8-6.8	W/G T9	
6.	H6 2-3	11500 10	100 210	11500 9.75/20D	11.25/22	Wau 6BLK	6-3	3x3x3	577 4.8	110-250	120-250	N	W/G T9	4 Tim 53440H	SF	H 5.8-6.8	W/G T9	
7. F.W.D.	H8 1/2-2	2440 132 166	13000	4700 6.50/20D	7.50/20	Wau MS	6-3	3x3x3	242 5.4	185	84-3200	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
8.	H6 2-3	4285 132 170	13000	5800 9.00/20D	9.75/20	Wau MK	6-3	3x3x3	381 4.5	240	85-2400	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
9.	H6 2-3	4200 124 156	13000	6400 9.36/35	40/38	Wau SRS	6-3	3x3x3	398 4.5	240	85-2400	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
10.	CU6 3-4	5145 147 179	13000	8000 10.50/20D	11.25/22	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
11.	CU6 3-4	4845 147 179	13000	8000 10.50/20D	11.25/22	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
12.	SSU 3-4	5295 147 179	13000	8000 10.50/20D	11.25/22	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
13.	SSU 4-5	4905 147 179	13000	8000 10.50/20D	11.25/22	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
14.	SSU 4-5	6435 150 195	13000	4700 6.50/20D	7.50/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
15.	M15 5-6	6480 171 200	23600	8000 10.50/20D	12.00/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
16.	M16 5-6	6480 171 200	23600	8000 10.50/20D	12.00/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
17.	M16 5-6	5935 147 195	23000	9100 10.50/20D	11.25/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
18.	M16 5-6	5935 147 195	23000	9100 10.50/20D	11.25/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
19.	M16 5-6	6780 150 195	23000	9100 10.50/20D	11.25/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
20.	M17 5-6	6855 150 160	22600	9000 10.50/20D	11.25/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
21.	M17 5-6	6855 150 160	22600	9000 10.50/20D	11.25/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
22.	T26 6-7	2500 150 22700	12700	11000 10.50/20D	12.00/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
23.	T26 6-7	2500 150 22700	12700	11000 10.50/20D	12.00/20	Wau SRS	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
24.	T72 25-30	7000 120	22600	10500 9.75/20D	10.50/20	Wau 125	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
25.	Hug 4-5	6180 160 22600	9000 10.50/20D	10.50/20	Wau 125	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
26.	Hug 4-5	6180 160 22600	9000 10.50/20D	10.50/20	Wau 125	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
27.	8704 5-7	6855 150 160	22600	9000 10.50/20D	11.25/20	Wau 125	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
28.	8704 5-7	6855 150 160	22600	9000 10.50/20D	11.25/20	Wau 125	6-3	3x3x3	412 4.5	260	91-2300	7 2/4x10 1/2	Y	Wu 5B33	5 Tim 63620	S	H 5.14-8.0	Wu 5B33
29.	Indiana	12X 1/2-2	131 180	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
30.	Indiana	12X 2-3	181 210	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
31.	Indiana	12X 2-3	181 210	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
32.	Indiana	12X 2-3	181 210	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
33.	Indiana	12X 2-3	181 210	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
34.	Indiana	12X 2-3	181 210	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
35.	Indiana	22X 5-6 1/2	181 210	4420 6.50/20D	7.50/20	Her JXC	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
36. Mar-Herr. LDI-4 1/2	C5A 1/2-2	112	131 180	2460 6.00/16D	7.50/15	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
37.	C5B 1/2-2	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
38.	C5B 1/2-2	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
39.	C5B 1/2-2	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
40.	C10-4	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
41.	C10-4	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
42.	C20-4	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
43.	C30-4	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
44.	C40-4	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
45.	C50-4	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
46.	C55R 4-5	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
47.	C55R 4-5	121	131 180	4420 6.50/20D	7.50/20	Ford D13000	6-3	3x3x3	242 5.4	170-2200	7 3x11 1/2	Y	BL 72	5 Tim 63620	S	H 5.14-8.0	Wu 5B33	
48.	C55R 4-5	121	131 18															

Dennett: New Models as Shapers in Reconstruction

Line Number	MAKE AND MODEL	GENERAL. (See Keynote)		TIRE SIZES		ENGINE DETAILS						TRANSMISSION		REAR AXLE		FRONT AXLE		BRAKES		FRAME							
		Chassis Price	Frontage Rating	Dual rear	S-single rear	Front and Rear Tire Size	Front and Rear Tire Size	Displacement	Comp. R.P.M.	Max. R.P.M.	Torque Rate	Max. Brk. ft.	Brake P.M.	Given	Model and Make	Model and Make	Powerd Sps	Drive and Type	Center Ratio	Model and Make	Model and Make	Service	Brake				
1 LEM0047TSW74R	Wheeler (Continued)	1440	OP	6500	6,50/20D	32x6	Wau 6BK	282.5	2190	85-3200	7-2%	101%	N	NBL 234	4 Tim SW75	WF	H.6-7-7-4	Tim 3000H	L61HV	532	688	A	TX Opt				
2 407TSW151	4R 2.5	1440	OP	7000	8,32/20D	32x6	Wau 6BK	282.5	2190	85-3200	7-2%	101%	N	NBL 234	4 Tim SW51	WF	H.6-7-7-4	Tim 3000H	L61HV	593	931	A	TX Opt				
3 507TSW151	4R 3.6	1440	OP	8000	8,32/20D	32x6	Wau 6MK	383.5	2422	85-2400	7-2%	101%	N	NBL 341	4 Tim SW51	WF	H.6-7-7-4	Tim 3000H	L61HV	593	931	A	TX Opt				
4 607TSW251	4R 4.8	1440	OP	9200	9,75/20D	40x8	Wau 6SR	644.5	456	462.5	520	330	102	2400	7-2%	101%	N	NBL 531	5 Tim SW51	WF	H.6-7-7-4	Tim 3000H	L61HV	633	1100	A	CD Opt
5 607TSW251	4R 5.0	1440	OP	9200	9,75/20D	40x8	Wau 6SR	644.5	456	462.5	520	330	102	2400	7-2%	101%	N	NBL 531	5 Tim SW310W	WF	H.7-2-9-1	Tim 3500H	W841A	966	1117	C	CD Opt
6 7 (1) ... 1200D	4R 7.8	14400	OP	11200	9,75/20D	40x8	Wau 6R	677.4	6450	120-3000	4-7	100%	N	NBL 751	5 Tim SW410W	WF	H.7-6-9-5	Tim 26050W	W841A	966	1517	C	CD Opt				
7 (1) ... 1200D	4R 10-12	14400	OP	11200	9,75/20D	40x8	Cum.Dle.H6	677.4	6450	120-3000	4-7	100%	N	NBL 751	5 Tim SW410W	WF	H.7-6-9-5	Tim 26050W	W841A	966	1517	C	CD Opt				
8 Mack	BX 2.5	17000	196221	14000	9,75/20D	40x8	Own CF	644.5	456	468.5	0	310	118	2400	7-3	121%	Y	Own BX	5 Own BX	2F	974	1518	A	TX Opt			
9 Mack	BX 4R	17000	196221	14000	9,75/20D	40x8	Own CF	644.5	456	468.5	0	310	118	2400	7-3	121%	Y	Own BX	5 Own BX	2F	974	1518	A	TX Opt			
10 (e.b.s.) ... CJ 4R	17000	196221	14000	9,75/20D	40x8	Own CF	644.5	456	468.5	0	310	118	2400	7-3	121%	Y	Own BX	5 Own BX	2F	974	1518	A	TX Opt				
11 (e.b.s.) ... BO 4R	17000	196221	14000	9,75/20D	40x8	Own BQ	644.5	456	468.5	0	310	118	2400	7-3	121%	Y	Own BX	5 Own BX	2F	974	1518	A	TX Opt				
12 ... BO 4R	17000	196221	14000	9,75/20D	40x8	Own BQ	644.5	456	468.5	0	310	118	2400	7-3	121%	Y	Own BX	5 Own BX	2F	974	1518	A	TX Opt				
13 ... BO 4R	17000	197233	15550	9,75/22D	9,75/24	Wau BQ	644.5	456	468.5	0	310	118	2400	7-3	121%	Y	Own BX	5 Own BX	2F	974	1518	A	TX Opt			
14 Mar-Her.	C5-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.*** 6-6	Own IX41	61H	496	629	A	TL Opt	
15 ... C2-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
16 ... C3-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
17 ... C4-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
18 ... B4-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
19 ... B5-7	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
20 ... C5-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
21 ... C6-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
22 ... C7-6	154	OP	5621	6,00/20D	32x6	Ford V8	83.4	133	221	6.1	146	85-3600	3-2	55%	N	WGT 79	4 Tim SW79	SF	H.7-3-6	Own IX41	61H	496	629	A	TL Opt		
23 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
24 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
25 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
26 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
27 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
28 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
29 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
30 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
31 ... TH516-4	14-17	17000	196221	17000	9,75/20D	40x8	Her HXD	644.5	456	468.5	855.5	4	555.5	160-2000	7-3	121%	Y	BL 7341	4 Tim MHR96	2F	H.*** 9-11	WHD 997	61A	1056	1626	A	TL Opt
32 Moreland	R-130D	2-3	3095	168.10	13000	8255	Her DXB	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2341	4 Tim 5411H	BF	H.*** 5-46	Tim 3100H	L41H	261	402	S	TL Opt
33 Moreland	R-170D	4-5	3266	168.10	13000	8255	Her DXB	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2341	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
34 Moreland	R-220D	6	5053	180.20	22000	814.1	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
35 Moreland	R-260D	7	5335	180.20	22000	814.1	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
36 Moreland	H-300CD	9	6045	180.20	20000	9114.9	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
37 Moreland	H-300CD	9	6045	180.20	20000	9114.9	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
38 Moreland	H-300CD	9	6045	180.20	20000	9114.9	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
39 Moreland	H-300CD	9	6045	180.20	20000	9114.9	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
40 Moreland	H-300CD	9	6045	180.20	20000	9114.9	SD 2241	644.5	456	468.5	259.5	145	178	73-2600	7-3	121%	N	SD 2241	4 Tim 5411H	BF	H.*** 6-37	Tim 3100H	L41H	261	402	S	TL Opt
41 Ster. (FBT130 2.8-7-8)	4105	162	198	28000	7325	8.25/20D	Wau 6BK	282.5	2190	85-3200	7-2	101%	N	SD 2241	5 Own U23	5 Own U23	5 Own U23	E	Tim 3000H	L41H	81	944	S	TL Opt			
42 (b) HCS120 4R 12-18	4880	155	207	32000	914.5	4033D	Wau 6BK	282.5	2190	85-3200	7-2	101%	N	SD 2241	5 Own U23	5 Own U23	5 Own U23	E	Tim 3000H	L41H	81	1024	S	TL Opt			
43 (b) HCS120 4R 12-18	4880	155	207	32000	914.5	4033D	Wau 6BK	282.5	2190	85-3200	7-2	101%	N	SD 2241	5 Own U23	5 Own U23	5 Own U23	E	Tim 3000H	L41H	81	1024	S	TL Opt			
44 White	904	4R 3-7	2975	166	214	7-75-20	Own 270	644.5	350	425	7-75-20	100%	100%	7-75-20	2F	SD 2241	4 Tim 5411H	WF	H.7-8-9-4	Own 161D	141H	566	1111	E	TL Opt		
45 White	904	4R 3-7	2975	166	214	7-75-20	Own 270	644.5	350	425	7-75-20	100%	100%	7-75-20	2F	SD 2241	4 Tim 5411H	WF	H.7-8-9-4	Own 161D	141H	566	1111	E	TL Opt		
46 White	904	4R 3-7	2975	166	214	7-75-20	Own 270	644.5	350	425	7-75-20	100%	100%	7-75-20	2F	SD 2241	4 Tim 5411H	WF	H.7-8-9-4	Own 161D	141H	566	1111	E	TL Opt		
47 White	904	4R 3-7	2975	166	214	7-75-20	Own 270	644.5	350	425	7-75-20	100%	100%	7-75-20	2F	SD 2241	4 Tim 5411H	WF	H.7-8-9-4	Own 161D	141H	566					

New Models on Shelves in Special Sections

After Hours

(CONTINUED FROM PAGE 28)

ship of hours of service to unemployment should be considered because unemployment is the greatest problem in the U. S. today. Shortening the hours of work, he said, is one of the most effective methods of increasing employment. The American Federation of Labor objective, he pointed out, is a 30-hour week. He admitted that at the moment he had no recommendation as to the exact hours that bus drivers should operate but he insisted that the Commission should consider the economic aspects of the matter.

EXAMINER Snow interrupted Mr. Ogburn's speech to declare emphatically that so far as the hearing was concerned the Commission could not go into the broad economics of the subject; that the hearing would concern itself solely with the relationship of hours of service to safety.

This stymied the labor spokesman. Actually the Examiner did him a good turn by interrupting because he was conveying the impression that labor had no case against the bus industry from a safety standpoint; that, as a matter of fact, it was not averse to long hours of service for drivers, and that its prime concern was with the basic wage and overtime arrangements.

Labor's lack of interest in safety was brought out in questioning by Mr. Kelly, chief of the safety section of the I.C.C. Motor Carrier Bureau. Mr. Ogburn admitted that his organization had no safety section, did very little to encourage safety among employees, and had no scientific data to prove the relationship between hours of service and accidents. A yeoman effort to make the stenographic record look brighter was made by Thomas P. O'Brien, general organizer of the International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers of America, who asked his labor colleague whether, "as a matter of fact," it was not true that safety was discussed at the regular meetings of the various locals. The way the question was put practically demanded and got an affirmative answer but no effort was made to define the nature and extent of the "safety discussions."

A suggestion that labor was the best agency to determine what are fair hours of service was contained in Mr. Ogburn's statement that the fair method of making hours flexible to take care of the varying needs of operators in different sections of the country is by contract through the application of collective bargaining. He asked the Commission to

give recognition to existing contracts.

AFTER Mr. Ogburn's testimony, Examiner Snow adjourned the hearing, which will be resumed to permit truck operators to present evidence in support of their desires. As plainly indicated by the Commission's Examiner, evidence, to be helpful, must definitely show the relationship between driver exposure and safety. There seems to be confidence in American Trucking Association circles that such evidence can be procured and presented in behalf of the trucking industry.

It is to be hoped that truck operators will not make any preposterous recommendations which may invoke the opposition of railroads and furnish organized labor with evidence to inflame employees against "labor-sweating" employers. There are reports that at the Chicago convention some operators insisted on 80 and 90-hour work weeks. Regardless of the merit of such a demand in individual cases, it is obviously preposterous to expect the Commission to entertain it seriously. The maximums prescribed by the Commission for railroads are, we believe, 16 hours in 24 and 60 hours per week. It is difficult to see how the trucking industry can expect greater liberality than that, and easy to perceive that unless the right sort of evidence is introduced, the daily maximum may be considerably curtailed.

The West Coast Hearings on Safety Regulations

THE opening hearing in Washington on the proposed safety regulations was reported here in October. Subsequent hearings were held in Portland, Ore., and Los Angeles, Calif. We had no opportunity to attend these hearings, but we did get a good look at the I.C.C. stenographic record. A study of it showed that except in one particular the testimony in substance differed very little from that presented at Washington. The one particular was brakes. There was opposition to the stopping distance requirements and to the provision calling for brakes on all wheels of vehicles two years after the effective date of the regulations. We neglected to take names, but we did take notes and quotes. Here is the quote of a witness who, we recall, appeared for a state association:

"It is our experience that brakes on front wheels, on either trucks or trailers, operating on either ice or snow, are entirely impractical, as it is impossible to keep them adjusted to such a degree that they will not affect the steering on slippery roads. We have found that one pair of heavy-duty brakes on the rear wheels of a vehicle are far superior to two sets of light or medium-duty brakes applied to both front and rear wheels;

BILL PLAYS A LONG SHOT... BUT HE'S TRIPLE PROTECTED



BILL'S TRUCKS WERE GOOD BUT NOT SO SPEEDY, JOE'S WERE FASTER, - YES INDEEDY.



ODDS ON BILL WERE MIGHTY LONG, HIS COMPETITION LOOKED TOO STRONG.



BUT, ONE THING JOE HAD OVERLOOKED, AND THAT IS HOW HIS GOOSE WAS COOKED



DAM NO. 2 ORDER DEPT.

THE TIRES HE USED WERE NOT SO SOUND, BILL BET ON GOODRICH AND WON THE ROUND.

Will you bet a 3c stamp against our Quarter?

It costs us 25c to send you the big 68-page Truck Operator's Handbook. We think it will save dollars for any truck owner. You can have one *free*.

THE B. F. GOODRICH CO., Dept. T-127, Akron, Ohio
Send me your *free* book.

Name _____

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this with respect to mechanical upkeep, weight and efficiency."

This witness suggested that the brake requirement be changed to a specified formula as to "amount of brake arrangements necessary for a given gross load."

Testimony brought out the practice of disconnecting front brakes in slippery weather to get "better steering and control of the vehicle."

Another witness argued that because trucks in general do not operate at passenger-car speeds, the stopping distances ought not to be comparable to those of passenger cars.

Safety glass was opposed on the

grounds that it tended to fog (the witness admitted his experience went back several years) and to impair the vision of drivers.

The sincerity of the witnesses is not to be doubted. But then, neither do we doubt that the suggestions are not likely to be entertained seriously.

FORD

(CONTINUED FROM PAGE 29)

The brakes have been improved. There is a new type adjusting wedge but the brakes themselves largely follow

previous designs. The control on the passenger car is by cable sheathed in a conduit.

STYLING has been changed and horizontal grill bars are used at the radiator. Radiator shell and hood louvers are of a new design. Rear vision has been materially improved in the passenger car line by increasing the size of the rear window. Vee type windshields are used on the passenger cars. All steel bodies including tops are used in the passenger cars and the same construction is used in the truck cabs. The battery is located under the hood for easy servicing.

The commercial car is offered with either engine so that the vehicle is adaptable to various kinds of work. The truck chassis comes in 131½ in. and 157 in. wheelbase. Only the 85 horsepower engine is used in the dump truck. The bodies available on the 112 in. chassis are stake, pick up, sedan delivery, and station wagon.

Optional axle and transmission gear ratios are available for applying the power in the most effective manner.

FORD CAR PRICES

V8—60 H.P.

5-window coupe	\$480
Tudor sedan	495

V8—85 H.P.

5-window coupe	520
Tudor sedan	535
DeLuxe tudor sedan	580
DeLuxe roadster	625
DeLuxe coupe, 5 window	565
Club coupe	625

Thomas Promoted

S. R. Thomas has been appointed manager of the automotive bearing division of the Bantam Ball Bearing Co., South Bend, Ind.

Stallings Joins Yale & Towne

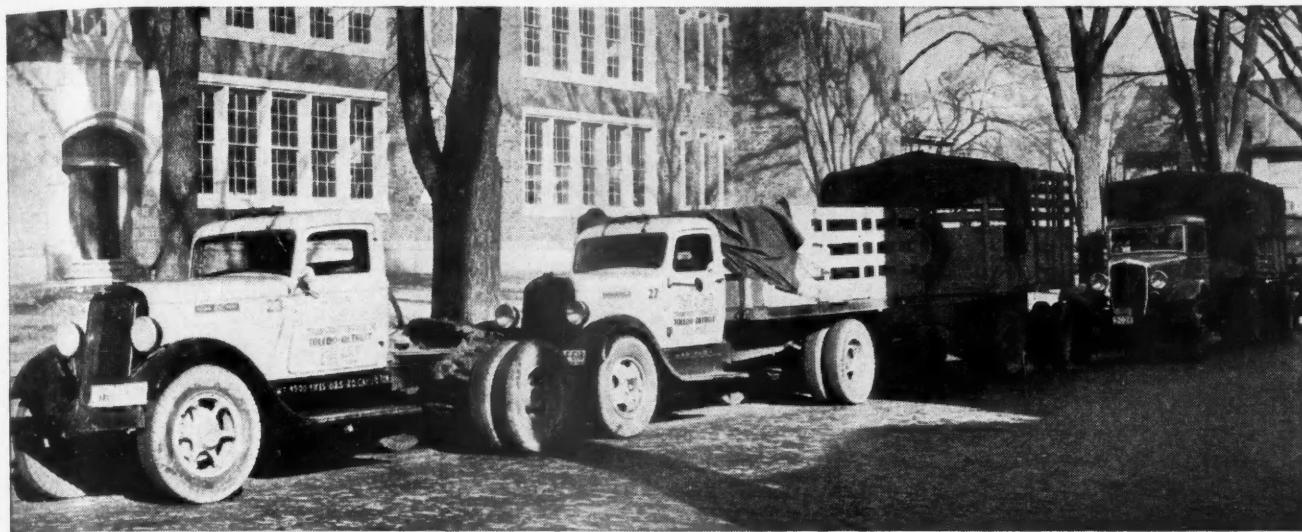
G. W. Stallings has been appointed Accessory Sales Manager for the automotive division of the Yale & Towne Mfg. Co., Detroit.

Aldrich Heads Dairy Fleet

Al Aldrich, formerly in charge of the Newton Coal Co. fleet in Philadelphia, Pa., has resigned to take charge of the fleet of the Fairfield Western Maryland Dairies at Baltimore, Md.

Research on Tire Chains

An Industrial Fellowship that is investigating broadly the durability of automotive tire chains has been founded at Mellon Institute of Industrial Research by the McKay Co., Pittsburgh, Pa., which manufactures commercial chains of all types. A comprehensive program of basic research is being carried on, including studies of the design, materials, processes of manufacture, and testing of chains.



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DeVilbiss

10 Common Faults of Truck Drivers

(CONTINUED FROM PAGE 17)

There can be no doubt about the educational value of our new photographs—taken on the spot after each accident in which a company truck is involved; or taken during a personal tour to watch the actual road habits of our drivers. These photographs are of intense interest both to our officials and our drivers. Each group of pictures tells a story. A story which no "alibi" of any driver can dispute. Most

often it isn't the kind of story that the driver wants displayed on the bulletin board.

A BRIEF history of our company accident-prevention and driver-training programs will help to indicate the value of these photographs. Our company founded in 1868, began some 12 years ago to substitute motor trucks for horse-drawn equipment. By 1932 we had about a fifty-fifty division of motor trucks and horse-drawn trucks; but not until the beginning of 1936 did the company get rid of its last horse.

With our slow-moving horse trucks

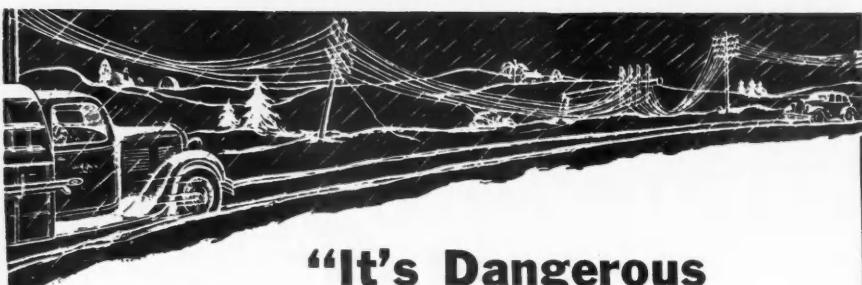
the "accident problem" was almost negligible, and mostly chargeable to normal "wear and tear." Also, in these beginning years our motor accidents were accepted as a normal part of the trucking business, and were left almost entirely in the hands of our insurance companies. In 1931 our 150 truck drivers were averaging about two accidents a day. In 1932, to combat the accident problem and lower our insurance costs, we initiated a program through offering safety awards to our drivers, earned that year by 31 of our 160 men. In 1934 our 166 drivers still had 402 accidents in 307 working days, even though 43 of these drivers had earned one-year safety awards and 16 of them two-year awards—accidents which cost us an average of \$45.08 each, including prorated overhead.

This high accident record impelled us in 1934 and 1935 to start three new safety measures—a preventive maintenance inspection system for all our trucking equipment; a thorough physical examination for all our drivers; and a rigid investigation of all accidents.

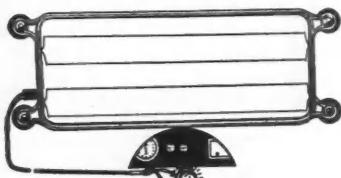
WE realize today that our P.M.S. (preventive maintenance system), begun in 1934, was a necessary step toward the reduction of accidents. Our records previous to 1934 indicated that not over five per cent of our accidents (and possibly a much smaller percentage) were due to the "mechanical failure" of our equipment. But this percentage, no matter how small, was often used as an "alibi" by our drivers whenever they had an accident. So we decided to eliminate all possibility of such alibis. We set up a really stiff preventive maintenance system. Our garage inspectors, every 1250 miles, followed through on a 44 point check for every motor vehicle. Every driver, every day, must hand in a "chauffeur's trouble card," and thereafter, in case of an accident, we simply would not accept any kind of alibi by a driver on mechanical defects. For it was his business, assisted by our expert inspectors, to "head off" all mechanical defects.

Also, we realize today that our new plan of a thorough physical examination of all drivers, started in 1934, was a second essential step toward our later success in the reduction of accidents. If it was right to "P.M.S." our trucks, it was right also to have a "Preventive Maintenance System" for our drivers. Of course, we had required a physical examination from all our drivers before being employed; but in many cases this examination had been years ago. Our new examination (now repeated every six months) was very complete, including a Wasserman and Kahn blood test. From this examination

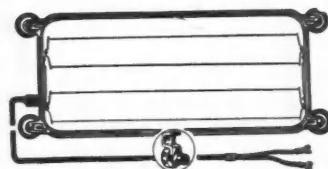
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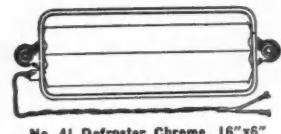
"It's Dangerous When Wires Are Down"



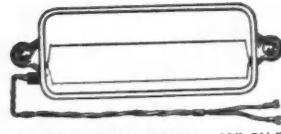
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No. 196 Defroster—Chrome with Illuminated Switch 16" x 7", List \$5.00

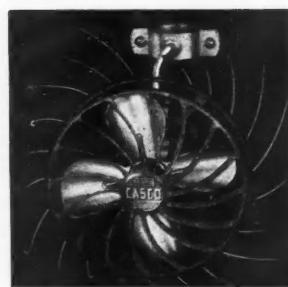


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No. 26 Defroster—Chrome—13" x 5 1/2" List \$2.25

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No. 35 DeLuxe Model \$3.75 list

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Also Casco Illuminated Switches for Defrosters and Hot Water Heaters, Fender Guides, Cigar Lighters, etc.

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The **Spicer** Needle Bearing Assembly. Exclusive licensees under Goetz U.S. Patent RE 18080.

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tion we learned many things about our drivers. We found that two of them could not see their hands in front of them without their glasses. One driver was blind in his left eye. Five per cent of them needed glasses for eye corrections, and about half of these had never worn glasses before. Four per cent were subject to hernia—all of whom were cured through operations and layoffs of six weeks to two months. There was one case of long standing and unsuspected venereal disease; and one case of goitre which was relieved by an operation at company expense.

It was the third feature of our 1934

safety program—a searching investigation of all accidents—that afforded the most convincing evidence of the need of the photographs. We had already brought all of our motor equipment under the highest possible mechanical control and we had already brought our drivers under the highest possible general health control. But our drivers still continued to have accidents regardless of the fact that they knew it was a company rule that no driver could continue working after he had three "at fault" accidents, no matter how long standing his employment. Thus, there were only two possible ex-

planations of such accidents—either the driver who continued to have them was physically unqualified for his job or he had bad driving habits.

The chief purpose of our rigid investigation of all accidents was to test the man's driving habits; and then help him to correct any wrong habits. We started each investigation by calling the driver in immediately. Then on a drawing board about two feet square, marked to represent streets, he was asked to demonstrate—with the aid of small models of trucks, trailers, automobiles, and street cars—the exact accident situation.

In the total, these three new methods—"P.M.S." for the trucks; physical examination of drivers; and rigid investigation of each accident—reduced our 1935 accidents by about 40 per cent. Thirty-eight of our 228 drivers earned one-year safety awards; 24 received two-year awards, and 14 three-year awards. Still, too many of our drivers—as proved by our accident investigations—had wrong driving habits.

This situation started our picture-taking program in January, 1936.

Our drivers are required, whenever they have an accident, to phone immediately to the office, or ask another passing truck driver to phone. Not to phone is accepted as presumptive evidence that the driver considered the accident his fault. It is the job of the writer to follow up promptly in taking pictures. Usually, with 10 to 30 minutes, I am at the accident scene. Usually I get my pictures before any of the by-standers or witnesses know my identity. The pictures will show the accident setting, traffic congestion, weather condition, street measurements, and often the important witnesses.

When a certain driver is under suspicion as having wrong driving methods, it may seem worth while for me to follow him about for a time, and get photos that prove his driving faults.

COMPANY records show that 75 per cent of our accidents involve drivers employed less than six months—before trained in "proper driving habits." We believe our accident and road photographs help to speed this training. These photographs keep our drivers keenly interested. This interest is stimulated by the display of typical photos on our large bulletin board with the names of all our drivers. Sometimes we add "skidding" remarks after an accident report; or display an enlarged picture of the accident.

Our new photograph plan seems to be working—an increase in company miles per accident from 10,646 in 1935 to about 14,000 miles per accident for the first six months of 1936. In 1934, we had an accident every 5960 miles.

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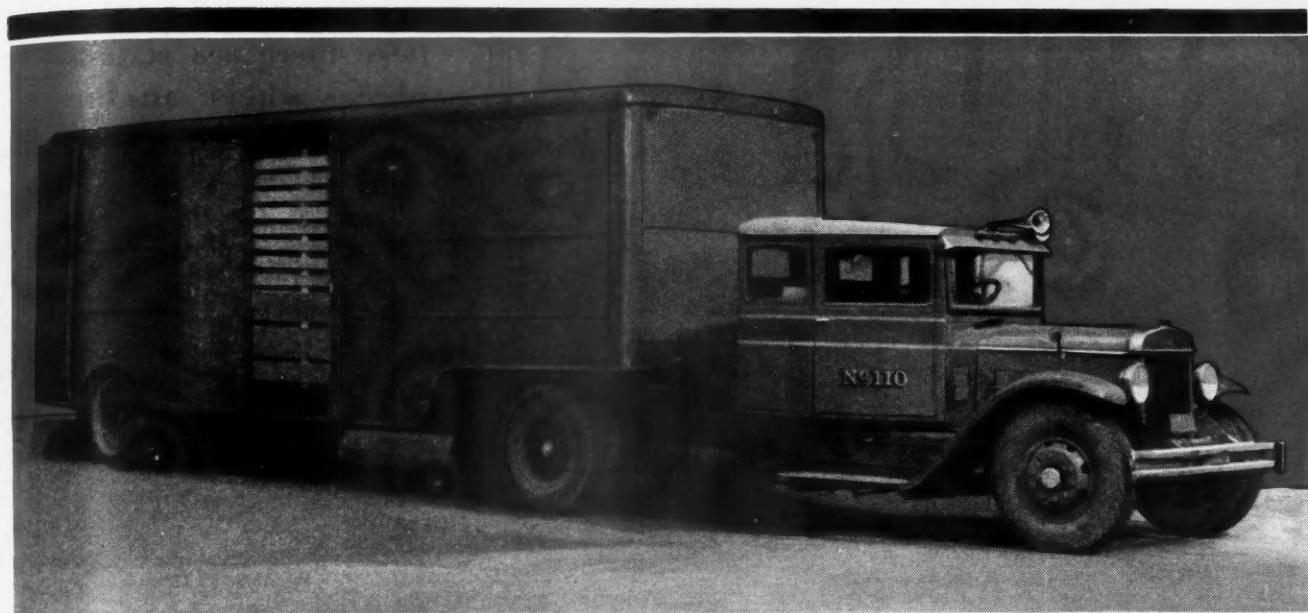


OFFICES IN NEW YORK,
DETROIT, CHICAGO

HASKELITE MANUFACTURING CORPORATION

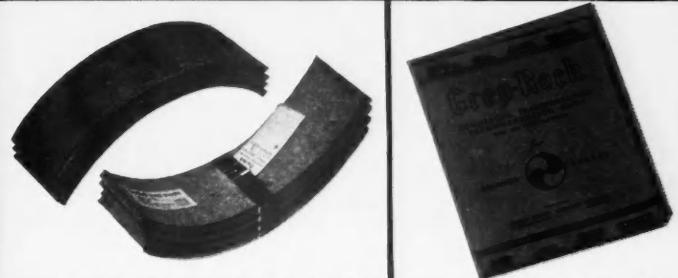
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Protect your trailer fleet. Its brakes must be so balanced that the rear axle will take hold first and hardest, the driving axle come in second, and the steering axle last of all. This is the only sure way to prevent heavy strains and a dangerous tendency to jackknife. On winter's icy roads it becomes even more important for protection of life, property, and profit.

Grey-Rock's two blocks, used as the Recommendation Guide tells you, will give balanced brake action to every vehicle in your fleet. See your Grey-Rock distributor.

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Diesels Double Economic Sphere of Trucks

(CONTINUED FROM PAGE 13)

rail carrier's advantage in line-haul cost to overcome the highway operator's terminal advantage. It follows that as rail LCL service was conducted in 1932, the highway service was the more economical for all hauls, when the full apportioned cost as revealed by the data examined are accepted as criteria. The same condition is true of highway operations of private shippers for distances under 650 miles.

This, at best, is only a comparison of the averages of the respective operations as a whole. There is such a wide variation in traffic and operating conditions on the highway, as well as on the railroad, that it is hard to compare the cost of similar service under like conditions for like commodities between the same points, which must be done, if we are to have a common standard of comparison.

The writer has just completed a study of transporting freight between Los Angeles, California, and San Francisco, California, by water, rail, gasoline and diesel truck. From this study it is possible to compare like service between the same points and determine the

sphere of economic utility for the various transportation instrumentalities. The costs of transporting freight in 20-ton lots, from industries located on railroad spur track, by rail, water and truck, for distances of 200 miles and 400 miles were determined. As the cost for 100 pounds varies directly with the length of haul, the respective spheres of economic utility can be readily determined. No attempt will be made in this article to do anything more than sum up and recapitulate the basic cost units determined by the study and to develop graphically the sphere of economic utility for the respective transportation agencies.

RAIL COSTS—For determining rail costs the operating expenses, freight proportion, were taken from Schedule 320 of the Southern Pacific Company (Pacific Lines) for the year 1931. The year 1931 was selected as being more representative of present conditions for the reason that that was the last full year for which the full base pay of employees was in force. Also, for the reason that traffic density for 1935 is approaching that of 1931.

The expense items developed to show the cost, were:

(1) Terminal Cost:

This is the cost incurred in originating or terminating a car. The study developed a cost of \$9.78, to originate

or terminate a car or a total terminal cost per car originated and terminated of \$19.56.

(2) Line-Haul Cost:

This cost was developed by assigning all line-haul expense to three different items, as follows:

- (a) Gross Ton Mile Expense
- (b) Net Ton Mile Expense
- (c) Car Mile Expense.

The cost of car repairs, depreciation and retirement was adjusted to be more nearly in accordance with the number of car miles operated on line, by increasing these expense items in proportion to the excess of the average number of cars on line over cars owned.

THE annual report of the Southern Pacific Company's Pacific Lines shows \$1,149,900,000 invested in railway property used in transportation service on Dec. 31, 1935. The costs herein include a return of 5.75 per cent on the fair value of the freight proportion of this investment in property, taken as \$649,093,860, which can be regarded as conservative.

Costs were first determined for 200 and 400 mile hauls, 20 ton loadings, to and from industries located on spur tracks. Then, by adding a local drayage charge of four cents per 100 pounds, for pickup or delivery, the cost



"I GIVE YOU Sunshine WITH EVERY MEAL"



"I GIVE SUNSHINE TRUCKS A BRILLIANT,
DURABLE FINISH that KEEPS THEM
GLEAMING EVERY DAY!"

SUNSHINE BISCUITS are known for their delicious flavor from one end of the country to the other. Equally famous is the cleanliness of the Thousand Window Bakeries.

In keeping with the rigid Sunshine standards of cleanliness, Sunshine trucks, too, maintain an unwavering spick and span policy. They *must* be bright and clean all the time.

That's why Sunshine, along with so many other fleet owners, selected DuPont Automotive DULUX for their trucks. For Automotive DULUX has the reputation of being the finest finish for commercial vehicles money can buy. It gives the qualities truck owners de-

mand—brilliant, gleaming lustre, remarkable durability and operating economy.

Every sparkling Sunshine truck is a splendid Sunshine advertisement. By their own cleanliness and brilliant finish, they remind people of the purity of Sunshine biscuits. In this way, DULUX is not only a money-saver through lowered maintenance costs, but it is a business builder.

Figure on a gleaming DULUX finish for your own trucks! Give them the finish that's famous for its fine appearance, that stands up under hard daily wear and tear, mechanical injury and year-round beatings from the weather . . . the finish that reduces refinishing

costs to the lowest possible point.

You can apply DULUX yourself right in your own shop. Or you can have it done by your DuPont Refinisher. Ask him for complete information. E. I. duPont de Nemours & Co., Inc., Finishes Division, Refinish Sales, Wilmington, Delaware.



**AUTOMOTIVE
DULUX**

REG. U. S. PAT. OFF.

to industries off spur tracks was determined. The full rail costs, including 5 1/4 per cent on investment, but not including Federal Income Tax, together with the basic cost units determined, are shown in Table I.

TRUCK COSTS were determined from a study of actual operations between San Francisco, Calif., and Los Angeles, Calif. Only truck operations experiencing a 75 per cent load factor and 6000 working hours per year are used in this study.

For basic cost units and cost per ton and per 100 pounds, for both gasoline and diesel operations see Table II.

Only six-wheeled trucks and six-wheeled trailers were used in the study. These units of truck and trailer weighed 68,000 pounds. They averaged, when laden with maximum load, 30 tons per round trip, or a 75 per cent load factor. The diesel trucks were equipped with Cummins diesel motors; the gasoline truck, with Waukesha motors.

To determine the cost of waterborn traffic, between Los Angeles and San Francisco, an average was taken of the cost of operating vessels for 64 voyages; the expense was divided between cost of operating vessel, cost of

handling and checking cargo, general administration expense and the average cost of transporting the cargo from store-door of shipper to steamer dock and from steamer dock at destination to store-door of consignee. This transportation to and from steamer docks to store-door of industry is performed by local draymen. The cost of local drayage is the same, regardless of whether or not the industries shipping and receiving the freight are located on rail. For abstract of steamer costs, developed by the study, see Table III.

The cost of transporting freight in 20 ton lots, by rail, truck and water, for distances of 200 and 400 miles, as developed in Tables I, II and III are set forth in Table IV, for ready reference.

The data contained in Table IV are shown in graphic form on Chart No. 1. Since the cost of transporting freight by rail, truck and water is a straight line variation, it is possible to read from the chart the cost of transporting freight by any one of the three instrumentalities, in cents per 100 pounds. It is then possible to determine the sphere of economic utility of each mode of transportation, for the same service, between the same points, for average car-load shipments. The chart shows:

That the diesel has more than doubled the economic sphere of trucks;

That gasoline truck costs meet rail costs between industries located on rail, at 200 miles;

That diesel costs intersect the rail costs at 430 miles.

This means that gasoline truck transportation is cheaper than rail, for 20 ton loadings, between industries located on rail for all distances under 200 miles, and diesel truck transportation is cheaper than rail for all distances under 470 miles.

Between industries located off rail gasoline truck transportation, of 20 ton loadings, is cheaper than rail for all distances under 470 miles and diesel return lower costs for all distances under 970 miles.

Gasoline truck transportation is cheaper than water transportation, for all distances under 365 miles, and diesel truck transportation is cheaper than water, for 20 ton loadings, store-door to store-door service, for all distances under 520 miles.

Water transportation is cheaper than rail or truck transportation, for all distances above 520 miles.

The 1935 report of the operations of the Southern Pacific Company (Pacific Lines) shows the average haul of revenue freight as 344.45 miles, and the average load per car as 20.42 tons. For this length of haul, and for this average weight of pay load, transportation by diesel truck is cheaper than rail, water or gasoline motor truck.

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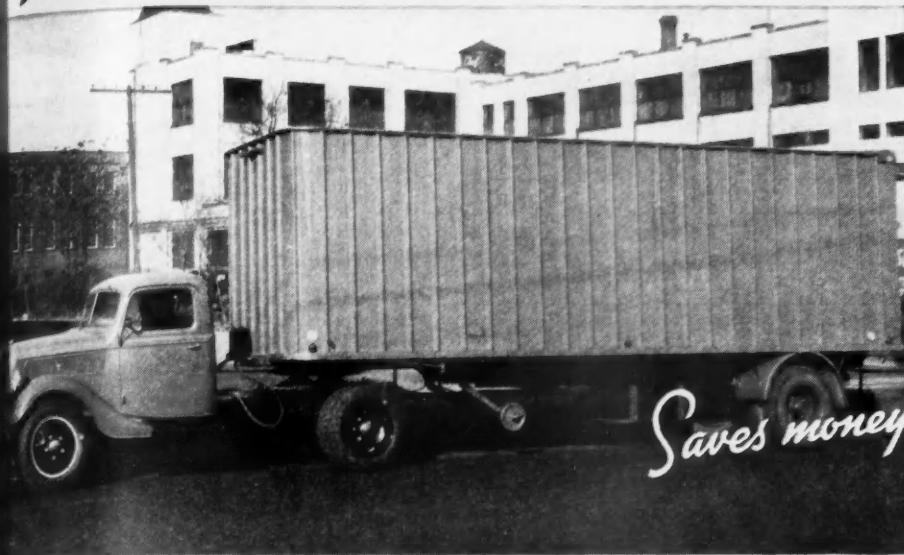
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"Supervised Transportation"
MONARCH GOVERNOR COMPANY / DETROIT



Builds Business by Maintaining Schedules



Ruckstell-equipped, Brand New and Ready to Go!

• Economy means different things to different people. To Mr. C. K. Green of Cleveland, real economy in contract freight hauling means the rigid maintenance of fast schedules, which depends upon a minimum of repairs to engines, axles, chassis. Maintenance of schedules brings more business. More business means greater profits.

But, no matter what your definition of economy may be, the Eaton Ruckstell 2-Speed Axle will give you the savings that you seek.

It reduces repair bills by providing the correct gear ratio for every load and road condition. Starts heavy loads without bucking or shock to driving parts. Prolongs engine life by reducing number of engine revolutions. Performs perfectly on hills. Gives more profitable speed on level roads. Provides quicker getaway in heavy traffic. Lowers gas and oil bills. Expands the field of utility of any make or type of truck.

The Eaton Ruckstell 2-Speed Axle is made for all trucks from 1½ tons capacity and up. More than 500,000 units of this type axle have been sold. Send for free booklet.

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CLEVELAND, OHIO



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Speeds Forward
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Saves money and increases business
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CLEVELAND, OHIO

November 13, 1936

Eaton Products, Inc.
Carnegie Avenue at East 65th St.
Cleveland, Ohio

Gentlemen:

You may be interested to know that we have just purchased from E. D. Latimer, 5100 St. Clair Avenue, Cleveland, two new Ford V-8 Tractors, equipped with your Eaton Ruckstell 2-Speed Axle—these to be used with Fruehauf Trailers. This makes seven jobs altogether on which your axle has been installed since last June. The original installation has gone over 50,000 miles, pulling an average load of ten tons.

We are contract haulers handling express merchandise between New York and Chicago. And our fine record of maintaining schedules in all kinds of weather has brought us a lot of business.

Hauling profitable loads without delay was practically impossible before we began using your axle. But now we are maintaining faster schedules without difficulty, saving time and repair costs. In fact, since equipping our Ford Tractors with the Ruckstell 2-Speed Axle, our engine repair bills have been greatly reduced, while lay-over time for repairs has become negligible. To our way of thinking this kind of economy far outweighs the savings in gasoline and oil.

We'll be glad to recommend your 2-Speed Axle to anybody engaged in the business of trucking for profit.

Very truly yours
Signed: (C. K. Green.)
Owner



EATON 2 SPEED AXLE

Spray of Paint Tricks

(CONTINUED FROM PAGE 25)

with a rag. A small section about two feet square is carefully covered at a time, allowed to set slightly, and rubbed off completely. Should it dry too much, the solution will crystallize and create a flaky surface. After this has been done over the entire surface from which the old paint has been removed, the surface is ready for refinishing. By now we have completely removed the old paint down to the bare metal and have thoroughly treated this surface to eliminate all possible danger

of anything happening to the new finish. The method has never failed.

The primer-surfacer is sprayed on holding the gun about 12 in. from the surface. This coat is applied working from the bottom up. If the process were reversed, the spray fumes would settle on the lower part of the panel before the gun hits it, thus creating a thin film that might ruin the job. The primer-surfacer is applied over a small section at a time whenever possible without stopping in the middle of a panel. The first spray is applied from side to side—horizontally, and immediately gone over up and down—verti-

cally. This assures complete coverage. This coat will set in about half an hour and dry on the surface in four hours. As a precaution, it is allowed to set overnight as otherwise the thinner in the color coat would soak through and loosen the surfacer.

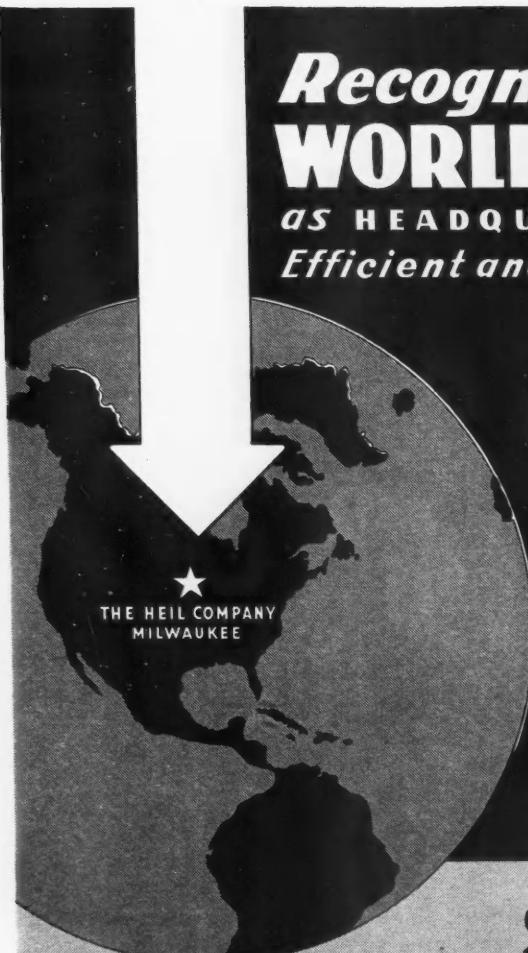
The primer-surfacer is thinned about 40 per cent. The amount of thinning, of course, may depend on the primer used. However, we find 40 per cent compatible with the primer used. The primer, if applied too heavily, will cause a rough finish.

Two color coats of synthetic enamel complete the job. The first color coat is thinned 30 per cent. It is applied with the spray gun, held 8 to 10 in. from the surface, with a side to side movement—horizontally, and from the bottom of the panel working up. The entire job is done this way and allowed to set for one hour. The second coat of color is then immediately applied in the same manner. This second coat, however, is thinned 35 per cent and mixed with synthetic clear. The advantages of this mixture are higher gloss, better body and a more solid job. Proportions are 80 per cent of color, 20 per cent of clear synthetic and then thinner to the extent of 35 per cent of the volume, is added.

Chassis, fenders and running board are sprayed with black synthetic. In preparation, the chassis is cleaned thoroughly with a cutting liquid such as gasoline or kerosene. After the dirt and rust has been removed, a mist coat of shellac is sprayed on. This coat really consists of 25 per cent shellac and the rest is alcohol. This mist coat acts as a sealer, covering any dirt or grease which may not have been removed. It is also a protection against rust. When dry, the synthetic black is sprayed over this shellac coating.

In the course of the refinishing work, we have experienced several difficulties which were finally overcome. In one instance it was found that on some jobs, spots would stand out more glossy than others. It was determined that this was due to improper washing and neutralizing. It was almost impossible to overcome this condition on porous metal, especially, until the following trick was resorted to. A coat of shellac mixed with alcohol, in the same proportions as used on the chassis, was sprayed on. This mist coat served as a sealer and stopped the trouble.

Another common problem is that of keeping the color coat wet while the body is being sprayed. This is managed by using 45 lb. pressure which, in the case of the gun we use, permits slightly more air than usual. This practice should be carefully watched, as too much air will cause bubbling as the paint hits the surface.



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We positively assert that no other filter offers the same economy to the operation of trucks and buses, and we ask a comparison of the length of time that a lubricant retains its clean, yellow color...a definite indication that the filter is doing its job.

There was a time when perfect lubrication was merely an ideal. The "N" type Purolator filter dispels any such theory...and brings into being a lubricating system that functions perfectly, just as long as the element is replaced when the oil begins to show signs of discoloration.

That operation is quick...and inexpensive. We ask the maintenance departments of the big commercial fleets to check these assertions.

This filter functions so effectively that the oil retains its color for thousands of operating miles...retains its lubricating qualities...neutralizes crankcase acids...lengthens the time between changes and saves dollars and dollars in operating expense.

You will be surprised at the definite and provable maintenance savings inherent in the "N" type Purolator for buses and trucks. Let us have your inquiries. Motor Improvements, Inc., 365 Frelinghuysen Avenue, Newark, New Jersey, makers of

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The Oil Filter

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For running-in new and rebuilt engines use auxiliary lubricants containing "dag"® Brand colloidal graphite.

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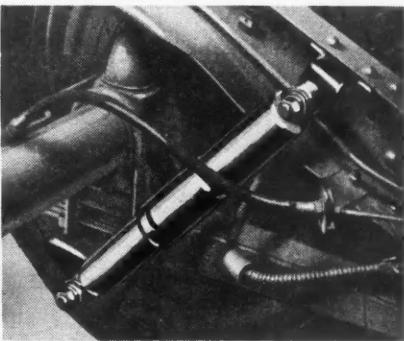
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Calling On All Cars

(CONTINUED FROM PAGE 23)

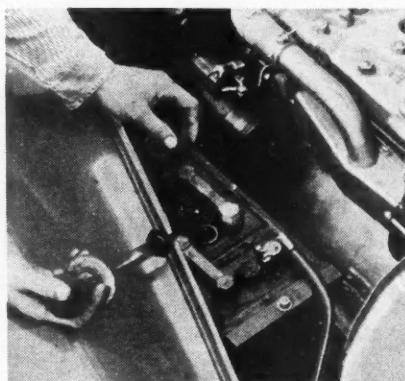
at the same time the larger engine turns over more slowly as a result of reduced final drive ratios. Oldsmobile and Pontiac increased engine sizes. Hudson and Terraplane increased power output by improving carburetion and manifolding. Terraplane is especially interesting with a dual carburetor on a six-cylinder engine. This is probably



The trend is to two-way, direct acting shocks which cushion rear axle rebound

the first time this step has been taken in the United States with a six-cylinder engine. It will be interesting to see if this experience is the forerunner of a trend. As something new in carburetion it is worth watching.

THE 1937 models seem to be uniformly harder to service. The concentration on front-end appearance which in the opinion of the manufacturer would appeal to the buying public has



The battery under the hood simplifies servicing

occupied all of the designers' time with the result that the mechanic has not been considered. The engines are low down surrounded by high sides and wide fenders. Interference with essential operations by non-relative parts has been increased notably with steering columns. In some cases after lifting the hood it is necessary to remove

THE SPECIAL honeycomb construction of the Sponges Sponge Rubber Seat Cushion for Trucks and Buses, gives exceptional riding qualities.

The total air space within the cushion is so great, that there is no "packing" of the rubber under these severe shocks. Vibration is effectively absorbed, too. Sponges Sponge Cushions have no metal in them—removing all danger of injury. They can be counted on to last as long as the vehicle in which they are installed.

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ENGINES



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DOUBLE
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McKAY Multi-Grip Double-Bar-Reinforced Truck Chains

THE MCKAY COMPANY
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COMMERCIAL CAR JOURNAL
DECEMBER, 1936

bolted sides before any engine operation can be performed. The only bright spot in the picture for the service man is that on Ford, Willys and Hudson the battery has been located under the hood where it can be removed or serviced without disturbing or soiling the inside of the car.

If there is a trend in piston design it is a trend away from a trend. The only thing that can be said to describe piston design is that manufacturers do not seem to be satisfied with it and constant research is turning up results that do not seem to have any similarity. Chevrolet has gone to the slipper type piston to reduce the weight of their cast iron piston and Ford has a completely new cast steel alloy piston. Chrysler is using a new U slot in alloy pistons while Packard and Graham use the new autothermic piston in which parallel strips of steel and aluminum control the heat expansion of the piston skirt. In the Buick there is a heat deflection groove above the top piston ring.

ENGINE lubrication shows some advances. Studebaker applies an oil filter with instructions that only seasonal oil changes are necessary if the filter cartridge is changed when the oil shows dirty on the dipstick. Dodge has increased the capacity of their filter and Graham feeds oil directly on to the cylinder bores under pressure from through the tappets which act as regulators. This should provide better lubrication in starting a cold engine. Chevrolet has substituted a gear pump for the vane pump.

Packard has 10 mm. spark plugs on the new six and the small Ford has 14 mm. plugs.

Overdrives for the transmission have made some headway. They come as standard equipment on the Studebaker and Pierce Arrow and at extra cost on DeSoto, Graham and Nash. No important change has been made on the gear box in any case from the operators standpoint although Chevrolet and Cadillac have redesigned to get a weight reduction and probably lower production costs. Clutch design appears to be satisfactory and static.

The industry appears to be saying farewell to rod controlled brakes as Ford adopts cable brakes. This will not be any reason for mourning among fleet operators as they like quiet cars as well as anyone else. In addition Ford has a new mechanical brake and there is very little change in brake design elsewhere.

There is a decided trend toward the use of direct acting shock absorbers to improve this thing called ride. Very few people seem to agree on what is a good ride and it will be interesting to

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"We have six tractors equipped with these sanders, five of which are ten ton units on pneumatic tires, and one a solid-tired, low carry-all unit, which carries a gross average load of sixty tons. These units are operated continuously over the mountainous highways of western Pennsylvania.

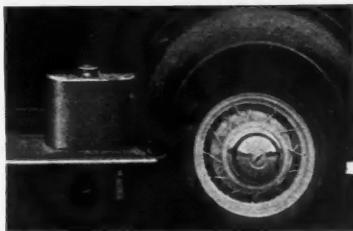
Our Lintern equipped tractors have enabled us to just about maintain summer schedules on our daily runs, despite the icy highways. In addition to this we have cut our winter accident record more than 40%. Our skid chain cost has been cut to less than 20% of what it used to be."

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Lintern Junior Sander for Light Delivery Trucks and Salesmen's Cars

A complete unit ready to install—on practically any coupe, coach or light delivery truck. Provides good traction under all weather conditions. Lowers chain costs, reduces tire wear, promotes customer good will and protects life and property.

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- HOLDS SECURELY
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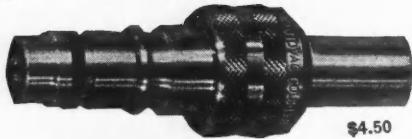
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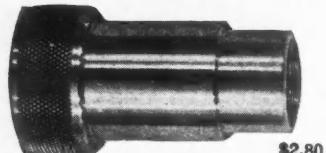


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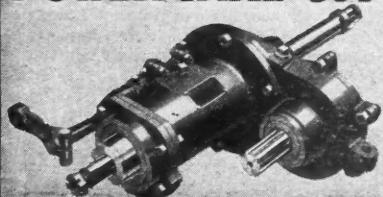
\$4.50



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SALES CO., INC.**
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HERCULES SPLIT SHAFT POWER TAKE-OFF



**for ANY TRUCK . . .
ANY PORTABLE
EQUIPMENT**

Hercules Split-Shaft Power Take-Offs are not transmission take-offs. They are installed in the drive shaft to transmit all of the power of the truck motor direct to any portable equipment. Various models available to operate as direct drive or from the side.

Consult Hercules Engineers with your Power Take-Off requirements.

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GALION, OHIO, U. S. A.

ALSO MANUFACTURERS OF DUMP BODIES AND HOISTS

see if the direct acting shock absorber helps them to make up their minds. The indirect shock absorbers are for the most part nested in the junction of the X member and the frame where it is next to impossible to service them.

MOST fleet operators are going to be interested in the wide adoption of defrosters as standard equipment. This consists largely of a duct or ducts that make it possible to spray the windshield with heat from the hot water heater or the manifold. Drip molding makes its re-appearance after several years absence. Just why it has been absent no one seems to know but it will be welcomed back with open arms.

Car bodies are more roomy which means that full sized people will be able to sit comfortably even with an overcoat on. The room seems to have been gained by making the body overall wider. This may indicate that in a few years the running board as such will be gone entirely.

Appearance is what you make it. There are plenty of gay shades for those that like them and all cars will be obtainable in somber colors where subdued cars are preferred. Rear vision has been improved in several cases by increasing the size of the rear windows.

Hercules QX Engines

HERE are additional details of the Hercules QX engines which were described briefly in COMMERCIAL CAR JOURNAL last month. The QX series consists of:

Model	Bore	Stroke	Displace.
QXA	3 $\frac{1}{8}$	4 $\frac{1}{8}$	190
QXB	3 $\frac{1}{4}$	4 $\frac{1}{8}$	205

These two models are identical in general design and appearance. Most of the parts are interchangeable.

The maximum torque of the QXA is 130 ft. lb. at 1000 r.p.m. and of the QXB is 135 ft. lb. at 1000 r.p.m. Both models peak at 3000 r.p.m. at which speed the QXA develops 55.5 hp. and the QXB develops 60 hp.

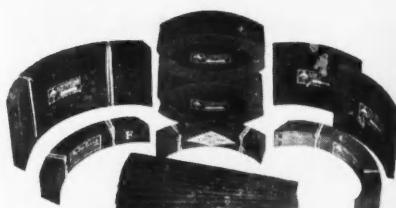
The QX series engines have the crank-

NEW ALCO 4-WHEEL DRIVE

For Ford and Chevrolet trucks offers revolutionary performance features never before found—a light, fast all-wheel-drive that piles up profits for the hauler on hard runs.

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LINDERMANS

A drum full of lining and the same pressure under every square inch.

Send for catalog 101-2c.

LINDERMAN DEVICES, Inc.
149 Broadway, New York, N. Y.

ALGOMA

offers the two finest plywoods for truck body construction and upkeep.

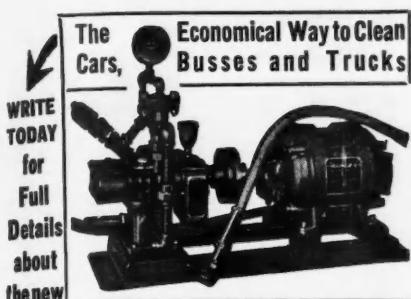
ALGOMALOID — the finest of plywoods; selected veneers, resin glue bond; in panels of any desired length, width up to twelve feet.

ALGOMETL — metal-faced plywood for side, end panels and doors; stronger than steel of equal weight, lighter than any other material of equal strength.

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ALGOMA PLYWOOD & VENEER COMPANY
BUILDERS BUILDING—228 NORTH LA SALLE STREET—CHICAGO, ILL
FACTORY, ALGOMA, WISCONSIN

COMMERCIAL CAR JOURNAL
DECEMBER, 1936



SPEED-WASHING
It's making bigger profits for wash rack operators and garage owners!
It's sharply cutting cleaning costs for fleet owners!
And—once any man realizes how much more he's spending in doing without it—he instantly sees why **Speedwashing** is the most wanted washing method in America. Find out who uses it—and what they think of it.

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TODAY!

ROTAWASHER
CORP. Dept. CC, 118 E. St. Clair Ave.
CLEVELAND, OHIO



Use genuine Timken Bearings for replacements. Look for the name "TIMKEN" stamped on every cup and cone.

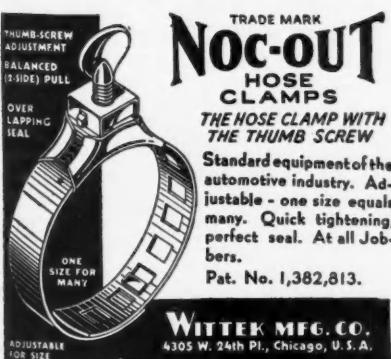
THE TIMKEN ROLLER BEARING SERVICE & SALES CO., CANTON, O.

FOR 1937—

THE DEARBORN LINE
CAB-OVER-ENGINE
FOR FORD TRUCKS

Radically lower in height—
Completely streamlined front end—
Remarkable accessibility for servicing.

TRANSPORTATION ENGINEERS, INC.
10441 Shoemaker Ave., Detroit, Mich.



case cast integral with the cylinder block. The crankshaft is 2 1/2 in. in diameter and is supported by seven main bearings. The front main bearing is 1 5/16 in. long, the center and rear main bearings are each 1 15/16 in. long and the four intermediate main bearings are 1 7/32 in. long. The connecting rods are 7 in. long from center to center with the bearing 2 in. in diameter and 1 1/4 in. in length.

The pistons normally are of cast iron, carrying four rings above the pin. Three are the compression type 1/8 in. wide and the lower ring is of the oil regulating type 3/16 in. wide. Piston pins are 7/16 in. in diameter.

The camshaft is on the right hand side. It is supported by four bearings 1 1/4 in. in diameter. The front and rear cam shaft bearings are 1 1/32 in. long and the two center bearings are 9/16 in. long.

The engines are of the L-head type and the valves have 45° seats. The exhaust valves have a clear diameter of 1 1/8 in. with the clear diameter of the intake valve being 1 5/16 in. The valves are actuated through mushroom tappets.

The overall length of the standard QX series engines is 35 1/16 in. The height is 20 9/16 in., and the width is 16 1/4 in. These dimensions are subject to slight variations due to different types of bell-housings and oil pans and fan assemblies for special applications.

The engines provide for the usual accessories and are built with a three gear construction at the front and providing a belt drive for generator. This swivel type provision allows the installation of any size generator.

New Products On Parade

(CONTINUED FROM PAGE 30)

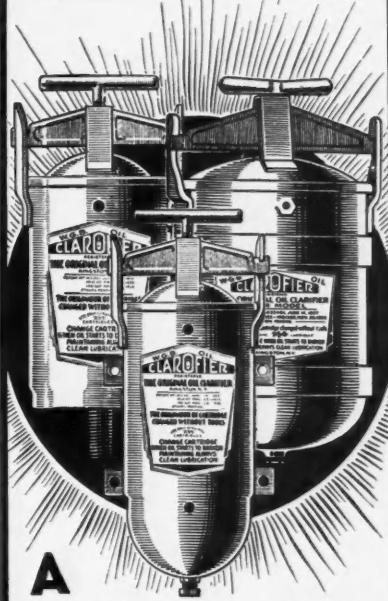
of the ammeter with current ranges of 0 to 25 amp. and 0 to 50 amp. and a voltmeter with ranges of 0 to 10 volts and 0 to 20 volts with a variable resistance unit of special design to carry high current. Another feature is the arrangement of switches to select the various ranges of voltage and current and a special switch to provide the means of changing the polarity to indicate both Charge and Discharge without change of connections.

In addition there will be shown for the first time at the A. S. I. show at Chicago the gasoline Mileage Tester which gives important facts concerning gasoline consumption that heretofore have not been available. This new device records on an easily read scale the gallon rate at which gasoline is consumed per hour at any driving speed and in addition provides the means of recording miles per gallon realized at any operating speed.

This company also will show at Chicago a new "U" Tube Mercury Vacuum Gauge calibrated to test a motor through the vacuum indication. This new product, besides giving an accurate vacuum indication, will enable the recording of output pressure from the fuel pump as well as vacuum or suction of the fuel pump.

(TURN TO NEXT PAGE, PLEASE)

GET RID OF ABRASIVES!



A W.G.B. OIL CLAROFIER

will eliminate abrasives, carbon and foreign substances from your oil which cause continuous wear on your motor. The W.G.B. Oil Clarifier will send a continuous flow of fresh, clean oil through the motor at all times—not just when the oil is first put in. Thousands of users change the oil only twice a year—winter to summer and summer to winter.

Write for information to

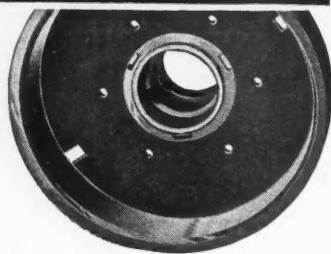
W. G. B. OIL CLARIFIER, INC.
102 GREENKILL AVE., KINGSTON, N. Y.

STANDARD OR SPECIAL PURPOSE DUMP BODIES



OVERSIZE HYDRAULIC HOISTS
WRITE FOR BULLETIN AND PRICES
THE PERFECTION STEEL BODY CO., GALION, OHIO

NEW BRAKE DRUM Wears 4 to 20 Times Longer



"used less pressure but was surer of legal stop" A LARGE bus company put the NEW, special alloy Cemcalloy

Brake Drums on one of its fleet. This is what the driver reported: "With these new drums I could stop in the required distance with just a touch on the pedal. My bus has only got 65 pounds pressure. Some of the others, with the old drums, have 75 to 90 pounds but can't always stop within the required distance."

Winter, with its extra strain on brake drums, is just ahead. It will pay you to investigate these new brake drums now.

Write for details and prices, stating makes and models, types of service and quantity.

CHRISTIANA MACHINE CO., Christiana, Pa.

CEMCALLOY Heavy Duty BRAKE DRUMS

Ahlberg GroundBearings

40%

Saving Over New Bearing Costs

AHLBERG BEARING CO.
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Everywhere

Ahlberg GroundBearings

Series 900
WALKER
Hydraulic Jacks

Give you extra value features for car, truck or bus equipment and heavy duty bench work or shop jobs. One of ten sizes—capacities 1 1/2 to 20 tons—at least. Order from your jobber—and see the complete line of Walker Jacks for every service need.

WALKER MFG. CO.
Racine, Wisconsin

EHCCO Portable Testers

ELECTRIC HEAT CONTROL CO., 9123 Inman Avenue, Cleveland, Ohio, announces the "KING" portable tester type MT-30. It is a self-contained unit, designed to carry all necessary test leads, also an all-aluminum adjustable tripod that is very compact. The test equipment includes voltmeter, ammeter, vacuum and compression gages.

Another item is the "KING" exhaust gas analyzer Type GA and GA-S. This number is mounted on a stand. This arrangement makes it possible to use it for service station work, and it can also be quickly removed from stand for road work by merely loosening one convenient thumbscrew.

In addition there is a new two-meter armature tester that will indicate a "ground."

Ordinarily 110 volt circuit is used for making the ground test and quite often an armature is passed as good, but trouble develops when it is again put back in service.

To overcome this lack of voltage there is incorporated a step-up transformer which develops sufficient voltage to positively indicate on the meter if the armature is "grounded." Often a slight ground can "be burned out," thus correcting the fault. A convenient test lead and push switch is provided for making ground tests.

Leak Proof Gasket

EDISON-SPLITDORF CORP., West Orange, N. J., has announced a new spark plug design which it is claimed will considerably improve the performance and lengthen the life of spark plugs. A new and unique type of gasket which is "spun on" to the spark plug in such a way that it becomes a self-contained part of the plug itself is used. This gasket cannot move out of position and absolutely assures a concentric fit. This fit makes it possible to achieve an absolute gas tight seal. With this new patented design tests have indicated that the gasket will last for the life of the plug itself.

Valve Refacer

SNAP-ON TOOLS INC., Kenosha, Wis., has the Blue Point valve refacing machine which sells for \$39.75. It is cataloged as No. A-100. The Vee block chuck is set upright and a case hardened pressure plate holds the valve stem securely in line. Ground, hardened inserts are embedded in the Vee block. The grinding wheel is motor driven but the valve is rotated by hand which makes it possible to control the surface speed of the face against the grinding wheel. The machine takes all valve stems up to 9/16 in. diameter including Ford mushroom end valves. The motor idles at 15,000 r.p.m. but works at about 8000 r.p.m.

Lubricant Meter

A NEW lubricant meter (Model 6325) has been introduced by the Alemite division of Stewart-Warner Corp., Chicago.

This fool-proof hand meter for volume

DEPENDABLE! WINDOW-WIPER

If you want air-brake dependability, write to the Hays Corporation, Michigan City, Indiana, for literature describing this new husky wiper that slashes through clogged mud or snow with the 100-lb. kick of the air-brake supply behind it.



AIR-PUSH WINDOW-WIPER

HOOF DASH-CONTROL GOVERNOR THE MOST SENSATIONAL SAFETY ACHIEVEMENT OF 1937.

Wire, 'phone, or write
for details now.

HOOF PRODUCTS CO.
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VALVES, PISTONS
PISTON PINS
VALVE GUIDES
VALVE SEAT INSERTS
CYLINDER SLEEVES
PACKLESS PUMPS
CHASSIS BOLTS
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ECCENTRIC and
RUBBEROD TIE RODS
OILITE BUSHINGS



Thompson Products

FWD Trucks

are available in sizes ranging in capacities from 1 1/2 to 15 tons.

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The Four Wheel Drive Auto Co.
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McCORD REFRIGERATION
—FUEL SYSTEM
FOR TRUCKS
REFRIGERATION
AT NO COST
—BY THE FUEL
THAT RUNS THE MOTOR

McCORD RADIATOR AND MFG. CO.
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Be Sure to Specify
MIDLAND
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POWER BRAKE
EQUIPMENT

Complete Kits Available at your
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Ask your jobber about the new
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DETROIT MICHIGAN
 Standard in the automotive industry
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Also Doors for Buildings



THORNTON

Dual Ratio Four Rear Wheel

DRIVE
FOR TRUCKS!
 Is setting new records!

THORNTON TANDEM CO.
 Detroit

FULLER

TRUCK TRANSMISSIONS

For easy shifting, quiet
 operation, hauling power
 and dependability, be
 sure to choose trucks
 equipped with FULLER'S.

FULLER MFG. CO.
 KALAMAZOO, MICH.

lubrication is built right into a control valve, with a double swivel nozzle that makes the most out-of-the-way gear case filler holes easy to reach. The meter is light in weight, and the operator's only effort is pulling the trigger to control the lubricant flow. The meter being in his hand, the dial is always visible, and he knows at a glance exactly how much lubricant is going into the gear case. Furthermore, the meter is never affected by high lubricant pressures and can be used on any gear dispensing unit.

Weight, 3 1/4 lb.; length, 9 in.; hose connection, 1/2 in. pipe thread.

General Oil Filter

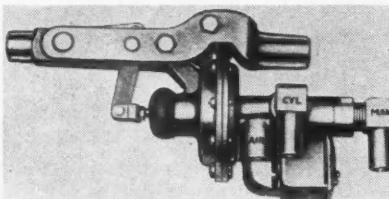
GENERAL oil filter, made by General Filters, Inc., 9001 Alpine Ave., Detroit, Mich., is mechanically protected against high pressure. There is no danger of cold oil causing the cartridge to collapse. It is so constructed that it is impossible for water and sludge trapped in the bottom of the filter to get back into circulation. The cartridge is made so that neither the dirt accumulation nor the filtering material can escape, causing a plugged line. The cartridge can be replaced by anyone in one minute. The list price of the filter is \$5.



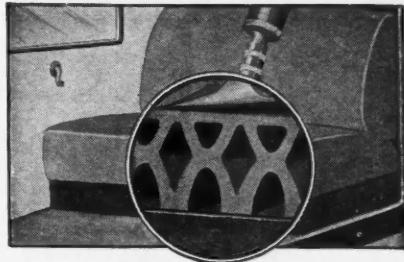
Brake Control Valve

A NEW compensating foot control valve that permits truck operators to apply frequent but light pressure on brake pedal has been announced by The Midland Steel Products Co.

This control valve is especially desirable



in heavy traffic when it is necessary to slow up without coming to a complete stop. This is made possible by a new arrangement of metering the vacuum in the power chamber gradually so that it does not reach its maximum until at least a pressure of about 50 lb. is exerted on the foot pedal.

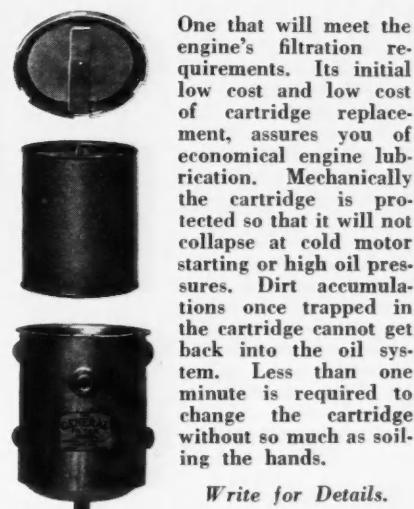


LOW PRICES FOR ALL-RUBBER SEAT CUSHIONS

You, too, will be delighted at the low cost of these famous Black Diamond All-Rubber Seat Cushions and back rests — especially when you take in consideration that their first cost is the last cost. Black Diamond cushions are in a class by themselves. Unequalled for quality, comfort, and scientific design—they're made to fit your present trucks or any new trucks you may buy. Write for details and prices.

KARPEX MANUFACTURING CO.
 1424 E. 19th St. Indianapolis, Ind.

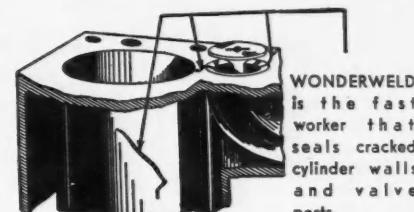
ANNOUNCING THE FILTER YOUR ENGINE HAS BEEN ASKING FOR



Write for Details.

GENERAL FILTERS, INC.
 9001 Alpine Ave. Detroit, Mich.

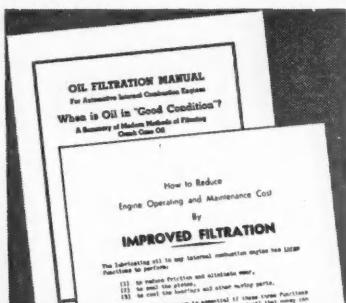
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WONDERWELD
 is the fast
 worker that
 seals cracked
 cylinder walls
 and valve
 ports.

MILLER MFG. CO.
 1218 KAIGHN AVE. CAMDEN, N. J.

THESE TWO MANUALS FREE!



Each Shows How You Can Cut Motor Maintenance and Operating Costs 30% OR MORE!

THE Briggs Oil Filtration Manual and four-page condensation discuss oil contamination, prove the need for a scientifically-designed filter to keep oil "refinery pure" in actual service.

They show how dirty oil "ups" motor maintenance and operation costs, how the BRIGGS CLARIFIER, proven by scientific tests to keep oil pure, can lower engine operating and maintenance costs 30% or more.

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Motor Tune-Up

is a real profit and business building service.

Send for free Tune-Up Charts

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Pin Hole Honing is Cheaper and Better than Reaming

Never a dull tool or blade-marked hole; small investment; nothing to sharpen; no guess-work or inaccurate fits. Low cost replacement abrasives; micrometer adjustment. Makes ANY mechanic an expert pin fitter. Ask your jobber today for Standard or Heavy Duty Pin Hole Set you need.

3-TOOL SET
\$24.00

HALL PISTON PIN HOLE HONE

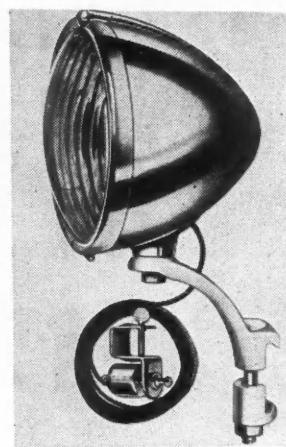
HERCULES POWER

Hercules Engines, both gasoline and Diesel, have long been standard equipment on many leading makes of trucks, truck tractors and delivery units as well as urban and interurban buses, road building and maintenance equipment, industrial, oil field and agricultural machinery. Hercules provides an engineering service which includes a study of specialized power applications.

HERCULES MOTORS CORPORATION
Canton, Ohio, U.S.A.
America's Foremost Engine Manufacturer
Power Plants from 4 to 200 HP.

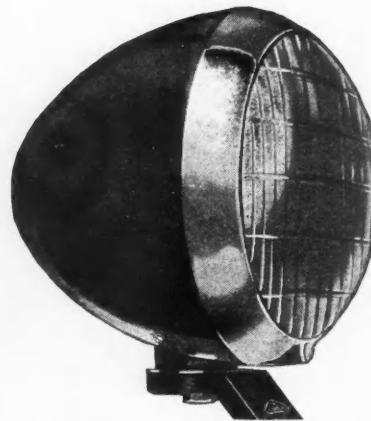
Appleton Fog Light

APPLETON ELECTRIC CO., 1701 Wellington Ave., Chicago, offers four models in its line of fog lights. These lights are sturdily constructed, using heavy gauge materials and iron brackets. Lenses are thick to avoid breakage. Model 47 finished in black is \$4; model 45 in chrome is \$5; model 42 in black is \$5; model 41 in chrome is \$6. Models 47 and 45 are Appleton models. Models 42 and 41 are Lorraine models.



Arrow Fog Light

THE Arrow auxiliary light is a fog light which actually increases driving visibility in fog, snow, sleet and rain. The special Arrow lens scientifically captures all the "fringe" rays and so concentrates them that the resulting powerful, non-glare, amber beam provides maximum light.



The streamline design of the Arrow shell is black enamel with a chromium trim. Mounting brackets and dash switch are included. Arrow Safety Device Co., Medford, N.J.

Sesamee Padlock Line

A LINE of new Sesamee padlocks has just been placed on the market by The Sesamee Co., Hartford, Conn. The line is complete, there being a size and style for every known application.

Unlike the former styles there are four instead of three number wheels allowing a greater choice of the opening numbers. Instead of the wheels being on the face of the lock they are now on the bottom side, free from rain and the elements.

THE COMPLETE LINE THAT COMPLETELY SATISFIES



THE FITZGERALD MFG. CO., TORRINGTON, CONN.

FITZGERALD GASKETS

TOLEDO

VALVES • GUIDES • SPRINGS • KEYS
SEAT INSERTS • WATER PUMP PARTS
CHASSIS BOLTS AND BUSHINGS
TRYON SHACKLES
SILENT "U" SHACKLES
HARRIS SHACKLE BUSHINGS
ECCENTRIC TIE RODS • PISTONS
CHROME-PLATED PISTON PINS

Write for Catalogs

The Toledo Steel Products Co.
3304 SUMMIT STREET
TOLEDO, OHIO, U.S.A.

BLACK & DECKER ELECTRIC VALVE SHOP

Rolls right up to the car with all tools necessary for a complete valve job



Ask your jobber, or write: The Black & Decker Mfg. Co., 732 Pennsylvania Ave., Towson, Md.

INSUL-IZE

Restore the Efficiency of the Ignition System of Fraction of Replacement Cost



No 323,507
Be Wise—Insul-ize

Red Insul seals high tension current, preventing current leakage.

Red Insul instantly starts motors stalled by water or moisture. An Insul-ized ignition system will not stall or fail to start in damp or wet weather.

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4 Wheel Drive Trucks

A proven product. 1 1/2 to 10 ton capacity. Write for complete information.

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